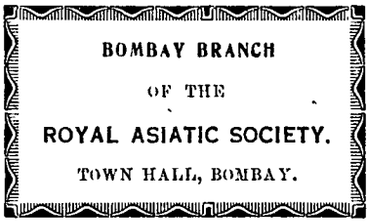
Annual Irrigation Revenue
Report. Sind
1882-83 to 1889-90

00133825



Digitized with financial assistance from

Government of Maharashtra

on 01 February, 2020

LIBRARY
OF THE
BOMBAY
BRANCH
OF THE
ASIATIC SOCIETY

ROYAL ASIATIC SOCIETY
LIBRARY
OF THE
BOMBAY
BRANCH
OF THE

133825

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1882-83.

ROYAL ASIATIC SOCIETY
LIBRARY
OF THE
BOMBAY
BRANCH

00133825

B—1254

LIBRARY
OF THE
BOMBAY
BRANCH
OF THE
ROYAL ASIATIC SOCIETY

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1882-83.

1889-90

12
10
1

B—1254

INDEX.

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

	Pages.
Annual Report of the Irrigation Department in Sind for 1882-83, with Statements.	1 to 27
Chart showing readings at Kotri and Bukkur Gauges for 1882	
Longitudinal section of the Kashmor Bund	
Index Map of the Province of Sind	
Letter from the Superintending Engineer for Irrigation in Sind, No. 93, dated 12th January 1884	28
Memorandum from the Commissioner in Sind, dated 28th January 1884 ...	28 to 30
General Abstract of Financial Results of Irrigation Works in Sind for and up to the close of 1882-83	31 & 32
Memorandum of Loss to the Canals on account of difference between Assessments of Water-rates on Jághír Lands and Assessments at the Ordinary Rates in force for Government Lands	33

ANNUAL REVENUE REPORT

OF THE

IRRIGATION DEPARTMENT IN SIND FOR 1882-83.

1. The inundation of 1882 was the highest on record. The river commenced to rise on the 1st June, and on the 22nd June had reached 14′ 6″ on the Bukkur gauge: there was then a slight fall to 13′ 0″, but on the 7th July the steady rise again commenced, and on the 30th July the river stood as high as 17′ 7″. It fell to 17′ 0″ on the 5th August, then rose again to 17′ 7″, at which height it remained for two days, and then commenced to fall steadily until it reached 12′ 0″ on the 3rd September. There were two flood waves after that which attained a height of 14′ 0″, and on the 30th September the river was at its usual height of 7′ 9″. As the chart shows, the river from the 3rd June to the 30th September was, with the exception of two slight depressions in the first and second weeks of the latter month, very considerably above the mean curve for the ten years ending 1879.

2. With such an unprecedented height as 17′ 7″, the highest previous reading on record being 16′ 1″, it is not a matter of surprise that the river embankments were very severely tried. The Kashmor bund fortunately remained staunch, although the water against the 38th and 39th miles was within a few inches of its crest; but the Sukkur-Begári bund was topped and breached in the 4th mile just beyond the Rahuja head of the Sukkur Canal, and the flood which passed through this breach caused a good deal of damage to the Sukkur Canal and Indus Valley State Railway between Bagarji and Ruk. South of Lárkhána the water from the river passed through the old breaches of 1878 in the A'bád Hatri bund which had never been repaired, and swept away the greater part of the rest of the bund: it then crossed the Gillespiewah and poured into the Nára which was already gorged: and the combined waters swept across the country north of Badra, breaching the railway line in several places, and flooding a large portion of the Mehar and Nasirabad tálukas. South of Hyderabad the breaches in the right and left bank bunds were numerous, in fact the bunds might as well not have been there, as the water went over the river bank which had never before been touched by a flood, and nearly the whole of the Sháhbandar and Jerruck districts was under water. The damage caused by the floods was not excessive in the Shikárpur Collectorate, and the loss on the kharíf was more than compensated by the increased area of rabi grown on the flooded land: but in the Karáchi Collectorate, where the lease system prevails and the terms of the lease fix the assessment both for the kharíf and rabi, no extra assessment on the rabi area, or at all events only on a very small portion of it, could be levied, and the result was a serious loss of revenue. In the southern districts of the Hyderabad Collectorate which are watered by the tails of the Fuleli and where the principal crop is rice, the damage was considerable, and the remissions were heavy.

3. The result of the season's operations will be seen from the table below, in which are shown the areas of kharíf and rabi, and the water share of the net consolidated assessments since 1876:—

Year.	Acres of Cultivation.			Irrigation share of net consolidated Assessment.	Remarks.
	Kharif.	Rabi.	Total.		
				Rs.	
1876-77	1,291,273	418,948	1,710,221	24,02,259	Flood.
1877-78	1,093,900	202,165	1,296,065	26,63,996	
1878-79	1,333,546	551,769	1,885,315	29,57,160	Flood.
1879-80	1,114,510	228,243	1,342,753	27,72,085	
1880-81	1,172,384	156,278	1,328,662	28,43,067	
1881-82	1,260,108	158,821	1,418,929	*33,57,557	
Average	1,210,954	286,037	1,496,991	28,32,687	
1882-83	1,281,691	226,601	1,508,292	32,52,517	Flood.
Difference	+70,737	−59,436	+11,301	+4,19,830	

* Of this sum Rs. 17,324 is Village Cess and should not have been entered.—H. N. B. E.

The steady increase of kharíf cultivation which was noticed in last year's report is apparently still going on, and the rabi area is about the same as it was in 1879-80. The irrigation share of net consolidated assessment, though nearly 4¼ lákhs higher than the average of the six previous years, is about a lákh of rupees less than that of the previous year, and the decrease falls nearly altogether in the Hyderabad and Karáchi Collectorates. The differences for the several districts are as below :—

	1881-82.	1882-83.	Difference.
	Rs.	Rs.	Rs.
Begári Canals	2,36,354	3,08,030	+71,676
Shikárpur Canals	2,37,935	2,30,962	−6,973
Ghár Canals	10,91,632	11,77,084	+85,452
Eastern Nára Canals	1,56,993	1,21,704	−35,289
Hyderabad Canals	7,01,305	6,24,005	−77,300
Fuleli Canals	3,77,522	3,44,072	−33,450
Karáchi Canals...	5,55,816	4,46,660	−1,09,156
Total ...	33,57,557	32,52,517	−1,05,040

These differences will be noticed further on in the body of the report, and it will be sufficient to remark here that the large increase in the Ghár Canals occurred notwithstanding that the remissions were higher in 1882-83 in that division by Rs. 57,550 than in the previous year: that the decrease in the Hyderabad Canals is due to the revenue off fallow lands having been included in 1881-82 and omitted in the year under report: and that the decrease in the Karáchi Canals is due to the heavy remissions of Rs. 1,06,505, and to the impossibility of levying assessment on any but a small portion of the rabi grown on the flooded area in the Sháhbandar districts.

4. The net canal revenue in the several irrigation districts is shown in the table below which gives the figures since 1876; and it may be noted that, as in last year's report, the net canal revenue shown is not the irrigation share of the consolidated revenue actually collected, but the share of that on the year's cultivation and due for collection; and that the hakaba and miscellaneous receipts included are the actual collections :—

Year.	Begári Canals.	Shikárpur Canals.	Ghar Canals.	Eastern Nara Canals.	Hyderabad Canals.	Fuleli Canals.	Karáchi Canals.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1876-77	1,49,137	1,76,637	7,16,720	1,51,719	6,02,822	3,48,354	4,27,931	25,73,320
1877-78	1,61,006	2,02,323	8,34,746	1,69,837	6,17,153	3,31,063	4,23,990	27,40,618
1878-79	2,09,362	2,30,156	8,58,919	2,86,321	6,84,636	3,28,382	4,42,608	30,40,434
1879-80	2,13,335	1,95,758	8,45,700	1,68,021	6,09,523	3,73,310	4,47,060	28,53,207
1880-81	1,91,186	2,01,920	8,52,004	2,08,468	5,66,958	3,82,634	5,46,862	29,44,032
1881-82	2,65,078	2,40,293	10,99,398	1,77,111	7,20,989	4,03,576	5,67,906	34,74,351
Average	1,98,184	2,07,931	8,67,915	1,93,580	6,33,689	3,61,386	4,75,059	29,37,744
1882-83	3,59,321	2,33,721	11,89,426	1,42,283	6,41,675	3,64,535	4,58,852	33,89,313
Difference..	+61,137	+25,790	+3,21,511	−51,297	+7,986	+3,149	−16,707	+4,51,569

The steady increase of revenue in the Frontier districts is very satisfactory: there was an abundant supply of water both in the Desert Canal and in the Begári Canal, and the increase of revenue in the year under report over that of the previous year, which amounts to Rs. 94,243, is due entirely to increase of cultivation. There have been no remissions on either of the canals for the past two years, and the land which was formerly almost ruined by the floods, is fast recovering. In the Shikárpur Canals the increase on the average, Rs. 25,790, is due to increase of cultivation. There is however not much chance of any further increase in the Rohri districts as they are liable to be swept by floods, and it is not advisable to do more than keep the existing canals in order. The ordinary revenue of the division may vary according to the nature of the inundation from 2¼ to 2½ lákhs, but cannot exceed the latter sum until the revised settlement comes into operation in the Shikárpur táluka, and the Sind Canal is enlarged in its upper section. The increase of revenue in the Ghár Canals is due to the introduction of the remission settlement, which during the

year came into force in the Kambar and Rato-dero tálukas. Under the old settlements a great portion of the cultivation paid no assessment at all, and no increased rate was imposed for a change of crop brought about by an improved water-supply: but under the revised settlements the whole cultivation is assessed properly, and an increased rate of 1 rupee per acre has been imposed on all rice grown on land assessed for dry-crop. In the Eastern Nára Canals there is a decrease of over half a lákh, and the net canal revenue for the year under report is the smallest of the series shown in the table. The minimum has however been reached, and now that the Thar Canal protective embankment is completed and that of the Mithrau Canal is well in hand, a steady increase of revenue may be expected yearly until the canals are working up to their full capabilities. In the Hyderabad Canals and Fuleli districts there is a slight increase on the average, but as in the former district the revenue off fallow lands has been included up to the year under report, it is impossible to give any explanation of the figures. The decrease in the Karáchi Canals is due to the heavy remissions rendered necessary by the very serious floods.

5. The remissions given during the year and in previous years are shown in the table below:—

Division.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	Average.	1882-83.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	16,576	8,301	899	213	1,955	..	4,657	..
Shikárpur Canals	18,624	16,869	16,859	604	1,415	53	9,086	842
Ghár Canals	2,18,100	9,790	82,061	4,214	12,198	9,268	55,938	66,818
Eastern Nára Canals	56,263	7,259	1,08,987	1,762	2,928	2,504	29,951	13,476
Hyderabad Canals	6,152	10,427	23,384	58,005	20,216	911	19,849	18,817
Fuleli Canals	11,642	14,937	61,308	929	2,622	2,917	15,726	5,248
Karáchi Canals	98,110	41,818	48,205	32,159	23,423	19,194	43,818	1,06,505
Total ..	4,25,467	1,09,401	3,41,703	97,973	64,757	34,852	1,79,025	2,11,706

The remissions should really be larger than shown in the last column as a sum of Rs. 12,685 on account of remissions in the Guni táluka of the Hyderabad Collectorate has not been included owing to their not having been finally approved by the Commissioner until after the close of the financial year. The details of the remissions and of the net canal revenue are shown in Table VII, and explanation will be given where necessary in the body of the report.

6. The revenue expenditure during the year on the several canals is shown in detail in Table IV. The several heads of expenditure for the year and six previous years are shown below:—

	Maintenance and Repairs.			Revenue Collection charges.	Total.
	Works.	Establishment.	Total.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1876-77	6,25,381	2,00,030	8,25,411	3,05,375	11,30,786
1877-78	6,65,741	2,25,413	8,91,154	2,43,789	11,34,943
1878-79	6,20,312	2,34,109	8,54,421	2,54,089	11,08,510
1879-80	6,87,162	2,38,070	9,25,232	2,38,744	11,63,976
1880-81	7,32,956	2,07,752	9,40,708	2,48,897	11,89,605
1881-82	8,86,044	2,12,897	10,98,941	2,74,070	13,73,011
Average	7,02,932	2,19,712	9,22,644	2,60,827	11,83,471
1882-83	8,68,991	2,22,036	10,91,027	2,72,052	13,63,679
Difference	+1,66,059	+2,324	+1,68,383	+11,825	+1,80,208

In addition to the above a sum of Rs. 1,20,143 was expended on extensions and improvements and Rs. 20,342 on establishment. The total revenue expenditure therefore was—

	Rs.	Rs.
Extensions and improvements	1,20,143	
Maintenance and repairs	8,68,991	
		9,89,134
Establishment, Public Works Department ...	2,42,378	
Do. Revenue	2,72,642	
		5,15,030
Total ...		15,04,164

7. The percentage of cost of Public Works establishment on the expenditure incurred on maintenance and repairs was for the whole province 25·55, and for each district separately—

Begári Canals	22·40
Shikárpur Canals	22·44
Ghár Canals	18·38
Eastern Nára Canals	24·23
Hyderabad Canals	23·97
Fuleli Canals	28·88
Karáchi Canals	39·10

The percentage for the province is slightly higher than it was in the previous year, but this is owing to a decrease in the expenditure and an increase in the establishment charges on account of a larger number of assistant engineers being now employed.

8. The percentage of expenditure on revenue and the cost of maintenance per acre during the year and for the six previous years was as below :—

	Cultivation.	Net Canal Revenue.	Maintenance and Repairs and Revenue Charges.	Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.
	Acres.	Rs.	Rs.	Rs.	Rs.
1876-77	1,837,572	25,73,820	11,30,786	43·93	·61
1877-78	1,418,863	27,40,618	11,34,943	41·41	·80
1878-79	2,016,089	30,40,434	11,08,510	36·46	·55
1879-80	1,454,028	28,53,207	11,63,976	40·80	·80
1880-81	1,492,669	29,44,032	11,89,605	40·41	·79
1881-82	1,601,986	34,74,351	13,73,011	39·52	·86
Average	1,636,868	29,37,744	11,83,471	40·28	·72
1882-83	1,673,293	33,89,313	13,63,679	40·23	·82

The percentage of expenditure on revenue is about constant, and the cost of maintenance per acre is a little more than 13 annas.

9. The direct and indirect receipts of canal revenue are shown in Tables VI. and VI. A. In the latter are shown the water share of the actual receipts of net consolidated revenue and the hakaba and miscellaneous receipts, and the figures agree with those shown in the administrative accounts. In the former table are shown the irrigation share of the net consolidated assessments on the year's cultivation as given in Canal Return VIII. furnished by the Collectors and Deputy Commissioners. In both tables the hakaba shown is incorrect as in it have been included a portion of the extra assessment levied for rice grown on wheel lands which ought to have been shown in Canal Returns VIII. and VIII. A. as consolidated land revenue. The figures in Table VI. A. have been left unaltered as the administrative accounts were printed before the error was discovered, and the necessary adjustments will have to be made in next year's accounts: but the corrected figures for the water share of consolidated assessments have been entered in Table VI. so that they may agree with those shown in the Commissioner's jamábandi statements. No correction is required for the Shikárpur Collectorate as the extra rate was originally credited to land revenue, and in the Frontier and Thar and Párkar Districts there was no extra rate levied: but in the Hyderábád and Karáchi Collectorate returns Rs. 1,021 and Rs. 17 have been included in hakaba, and these sums will have to be written back.

10. The actual realizations of consolidated revenue during the year, as shown in Canal Return VIII. A. submitted by Collectors and Deputy Commissioners, were for the several districts—

	Total for Collection.	Actual Receipts.	Balance outstanding.	Irrigation Share of Collections.
	Rs.	Rs.	Rs.	Rs.
Frontier, Upper Sind	3,20,631	2,67,291	53,340	2,40,562
Shikárpur Collectorate	17,11,445	15,49,002	1,62,443	13,94,103
Thar and Párkar	1,21,976	1,21,487	489	1,09,339
Hyderabad Collectorate	12,20,523	10,28,616	1,91,907	9,25,754
Karáchi Collectorate	5,58,889	4,74,295	84,594	4,26,866
Total ...	39,33,464	34,40,691	4,92,773	30,96,624
Land in Khelát	1,07,757	47,165	60,592	47,165

The total of Rs. 30,96,624 is the sum shown as the irrigation share of actual receipts in Table VI. A. The total for collection in Khelát is made up of Rs. 63,332, the unrealized balance at the end of the previous year, and Rs. 44,425, the assessment for the year less remissions under consideration, which amounted to Rs. 12,113.

11. The areas of kharíf and rabi cultivated during the year, the consolidated assessments on those areas, and the remissions are shown in Table VII. The abstract of results for the whole province is:—

	Area of Cultivation.	Consolidated Assessments.	Remissions.	Net Consolidated Assessments.	Rates per Acre.	
					Excluding Remissions	Including Remissions
	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.
Kharíf	1,281,691	32,62,217	2,02,361	30,59,856	2·54	2·39
Rabi	226,601	5,63,397	9,345	5,54,052	2·48	2·44
Total ...	1,508,292	38,25,614	2,11,706	36,13,908	2·54	2·40

The irrigation share of the net consolidated assessments, namely, Rs. 32,52,517, has been used for all the tables except No. VI. A. The rate per acre appears to be very small considering how large an area of rice is cultivated; but the areas of cultivation, as given in the canal returns, are not to be depended on, and the greater portion of the Hyderabad and Karáchi Collectorates is still under the old lease system.

12. The irrigating duty per cubic foot of supply for some of the principal canals is shown in Table VIII., and as remarks on this subject will be made further on when the operations of the several canals are treated in detail, it is unnecessary to make any remarks here. The rainfall in the Province during the year is shown in Table IX. It was higher than the average, and a good deal of damage was caused by it as it fell at a time when the river was at its highest, and was not required.

13. A general review of the results for the whole Province having been made, the details of the operations for the several canals may now be treated separately.

FRONTIER DISTRICTS, UPPER SIND.

Begári Canals.

Desert Canal.

14. The Desert Canal was opened on the 27th May and water reached the tail of the canal on the 29th. On the 1st June the down stream gauge at the regulator read 5·10, and the depth was gradually increased until the 14th when the gauge read 9·15: and from that date up to the end of August, with the exception of 21 days, the full supply was maintained in the canal. The Dhand at the head of the canal from which it derives its supply is now very favourably situated, and the supply throughout the season was good and the crops were excellent. The Muradwáh which takes off from the head of the canal, but which has a separate regulating sluice in the Kashmor bund, was completed and opened during the year, and worked extremely well. Applications for a large area of land were received but only 14,594 acres were given out, and the area actually cultivated was 10,808 acres. There was some waste of water on the tail of this canal, as might be expected, in the first year, but this can be prevented for the future by converting the road bridge on the Toj and Tangwani road into a regulator.

15. The areas of cultivation and assessed revenue on the Desert Canal in the Frontier Districts and in Khelát, and on its branch the Muradwáh, which is altogether in the Frontier Districts, were during the year—

	Cultivation.			Assessed Revenue.			Remissions.	Net Revenue.
	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Total.		
Desert Canal—	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.
Government land in Frontier, Upper Sind	59,739	1,322	61,061	1,08,212	2,644	1,10,856	..	1,10,856
Land in Khelát	21,718	121	21,839	21,718	121	21,839	7,618	14,221
Total ..	81,457	1,443	82,900	1,29,930	2,765	1,32,695	7,618	1,25,077
Muradwáh	8,194	2,614	10,808	16,037	5,219	21,256	..	21,256
Total ..	89,651	4,057	93,708	1,45,967	7,984	1,53,951	7,618	1,46,333

No remissions were given on cultivation in the Frontier Districts, but more than one-third of the assessment was remitted in Khelát. No explanation as to the reasons for such large remissions has been given by the Political Agent, Jacobabad, and it is difficult to understand why such large remissions should be considered necessary when the supply delivered beyond the Frontier was so good. There was a less area of cultivation beyond the Frontier than there was in the previous year, and there was ample water for the area entered in the table as cultivated. In all probability there was a far larger area under crop than has been shown in the returns, and the remissions were given on this excess area for which no assessment has been entered. The Desert Canal proper is now working up to its full present capacity, but the deepening of the head and lowering of the sill of the regulator, which is now being carried out, will increase the discharging power of the canal and admit of an extension at the tail, and an increase may in future years be expected. There will also be an increase on the Muradwáh, as the canal gets into working order and the supply is better regulated.

16. The charges on account of maintenance and repairs during the year were Rs. 11,730, which includes Rs. 2,797 for establishment and tools and plant: the cost of revenue collection was Rs. 9,620, and the total charges against revenue Rs. 21,350, or Rs. 1,337 less than in the previous year. The percentage of expenditure on revenue was 15·86, and the cost of maintenance per acre Rs. 0·23. The net revenue realized during the year was Rs. 89,996, and the interest charges during the year were Rs. 34,874: the net profit during the year was therefore Rs. 55,122, and the balance of net revenue to the end of the year was Rs. 3,89,334. The loss on account of hakaba on land in Khelát during the year was Rs. 14,304 as shown in Table VI. and in the foot note in the administrative accounts. The receipts on account of hakaba from Jághírs in British territory were Rs. 129.

17. The average discharge of the Desert Canal proper was for the 117 days, from the 1st June to the 25th September, 1,249 cubic feet per second, and allowing 56 cubic feet as the discharge of the old Maksudawáh which has hitherto been neglected in the returns, the average discharge was 1,305 cubic feet per second as entered in Table VIII. The total kharíf area cultivated in British territory and in Khelát, as well as the Jághír land in British territory both paying and not paying hakaba, which has hitherto been omitted, was 74,982 acres: adding to this an area of 6,158 acres which was flooded during the kharíf season and sown afterwards with a rabi crop, the total area irrigated was 81,140 acres, and the duty is 62·17 acres to the cubic foot. The average discharge of the Muradwáh was 312 cubic feet per second, and the kharíf area irrigated was 8,194 acres: adding to this the rabi area of 2,614 which was flooded sufficiently during the kharíf to bring the crop to maturity, the total area irrigated was 10,808 acres, and the duty is 34·64 acres to the cubic foot. This duty is small, but as was before stated, the canal was only dug and opened during the year, and waste of water occurred as might be expected.

Begári Canal.

18. The Begári Canal was opened on the 10th May as water was urgently required by the Kandahar State Railway for the tanks at Jacobabad and Jhatpat: and to enable the water

to be forced down the Nurwáh to supply these tanks a temporary bund had been thrown across the Begári below the head of that canal. This bund was cut on the 4th June, and water was passed down the Begári to its tail. There were a few breaches in the canal banks near the tail owing to the supply being increased rather too rapidly, and to their not having yet been raised to their full height and section: but the damage done was slight. A large breach occurred in the 7th mile where the old Sind Dhora joins the canal: but as 9 boats, varying from 40 to 200 maunds, which had been lying high and dry since the flood of 1878 at Ghaospur a few miles up the Dhora, passed through this breach into the Begári and so got into the river again, it is more than probable that the breach was purposely made with the connivance of the Dárogha in charge, who has been dismissed. The supply in the Begári and all its branches was good throughout the season and the crops were fine.

19. During the year under report there was a very large increase of cultivation both in the Frontier Districts and in the Shikárpur Collectorate, and the general results of the season's operations are most satisfactory. The areas of cultivation and assessed revenue during the year were—

	Cultivation.			Assessed Revenue.			Remissions.	Net Revenue.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.		
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.
Frontier Districts	78,492	3,496	81,988	1,57,457	3,239	1,60,696	....	1,60,696
Shikárpur	19,064	2,480	21,544	42,332	5,844	48,176	....	48,176
Total ..	97,556	5,976	1,03,532	1,99,789	9,083	2,08,872	....	2,08,872
Khelát	29,643	2,165	31,808	32,490	2,209	34,699	4,495	30,204
Total ..	1,27,199	8,141	1,35,340	2,32,279	11,292	2,43,571	4,495	2,39,076

As was the case with the Desert Canal there were no remissions on land in British territory, but on the land in Khelát about one-eighth of the revenue was entered as remissions under consideration. The area of land entered as cultivated in Khelát is less by 11,000 acres than it was in the year before when only Rs. 517 were given as remissions, and as the supply of water was if anything better than it was in that year, it is not easy to understand why so large a sum as Rs. 4,495 should have been considered necessary.

20. The steady increase of cultivation which has taken place in the last two years since the men have begun to feel confidence in the stability of the Kashmor bund, is very striking, and the result will be seen plainly from the following figures:—

		Cultivation.			Net Assessed Revenue.		
		Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.
		Acres.	Acres.	Acres.	Rs.	Rs.	Rs.
Frontier Districts...	1879-80 ...	23,437	5,401	28,838	78,266	2,245	78,511
	1880-81 ...	39,102	2,921	42,023	84,782	2,753	87,535
	1881-82 ...	56,485	5,219	61,704	1,16,152	5,868	1,22,020
	1882-83 ...	78,492	3,496	81,988	1,57,457	3,239	1,60,696
Shikárpur	1879-80 ...	1,896	2,894	4,790	3,927	5,044	8,971
	1880-81 ...	6,084	1,828	7,912	8,970	4,765	13,735
	1881-82 ...	12,721	1,398	14,119	22,384	2,463	24,847
	1882-83 ...	19,064	2,480	21,544	42,332	5,844	48,176

There were no remissions either in 1881-82 or 1882-83.

21. The charges on account of maintenance and repairs during the year were Rs. 70,659, including Rs. 15,456 for establishment and tools and plant: the cost of revenue collection was Rs. 16,347; and the total revenue expenditure therefore Rs. 87,006. The percentage of expenditure on revenue was 39·00, and

the cost of maintenance per acre Rs. 0·62. The net revenue realized during the year was Rs. 1,06,904, and the interest charges were Rs. 53,412: the net profit during the year was therefore Rs. 53,492 and the balance of net revenue to the end of the year was Rs. 3,28,754.

22. The average discharge of the Begári for 114 days, from the 9th June to the end of September, is entered in Table VIII. as 3,791 cubic feet per second. The surface fall in the first seven miles by measurement was 1·04 feet per mile for a depth of 8 feet, and 0·96 feet per mile for a depth of 12 feet: the mean of these, or 1·00 per mile, has been adopted in calculating the discharges; and as the sectional area with 12 feet depth is 1,194 square feet, the discharge of full supply is 4,693 cubic feet per second. The average discharge worked out from the observed surface velocities, with a coefficient of ·82, came to 4,184 cubic feet per second: but there is a doubt about the correct value of the coefficient to be applied, and the discharge calculated by Bazin's formula, with the observed fall and measured areas and hydraulic mean depth, has been adopted. The area irrigated during the kharíf was 141,267 acres, including 10,640 acres of Jághír land in the Frontier and in Shikárpur: but in addition to this there was an area of 6,933 acres flooded during the kharíf and sown with a rabi crop; and the area entered in the table is 148,200 acres: the duty is accordingly 39·09 acres to the cubic foot of supply. This duty is exceedingly small, and as the area under rice is not 6,000 acres, it is difficult to understand what becomes of the water.

23. The Kashmor bund was very severely tried during the height of the inundation, and at one time fears were entertained that it would not stand. The crest of the bund had however fortunately been raised to 6 feet above the high flood level of 1881 in the 38th and 39th miles, and a strong berm had been added at the back: and though the water was within a few inches of its crest in those miles it remained staunch. The expenditure incurred on raising and strengthening the bund during the year was Rs. 70,481, and the cost of maintenance and conservancy was Rs. 39,891. In addition to this a sum of Rs. 13,401 was expended on the clearance and extension of the Bakshaliwáh, and on the construction of a head sluice in the 41st mile of the bund, and falls in the 2nd mile of the canal. There were 645 acres of cultivation on the canal which gave a revenue of Rs. 1,271. The total expenditure on the bund was Rs. 96,624 for improvements, including establisnment, and Rs. 55,810 for maintenance and repairs, including establishment and charges in the Revenue Department. The bund may now be considered to be practically safe, and in future nothing more will be required than ordinary maintenance, unless the river encroaches.

SHIKA'RPUR COLLECTORATE.

Shikárpur Canals.

24. The canals in the Rohri districts worked well during the inundation, and there was a good supply of water throughout the season. The area under kharíf was 37,210 acres, or 3,297 acres more than in 1881-82, and the area under rabi was 14,138 acres, or 2,819 acres more than in 1881-82. The expenditure on maintenance and repairs was Rs. 27,925 and the total revenue expenditure, including establishment and cost of collection, Rs. 45,109, or about Rs. 2,600 less than the expenditure of the previous year. The areas of kharíf and rabi on the bunds in Rohri were 3,222 and 599 acres, which are slightly in excess of the areas of the previous year: and the expenditure on maintenance and repairs was Rs. 13,104, or Rs. 17,091, including establishment and revenue charges.

Canals in Rohri.

Bunds in Rohri.

25. The crops on the Sind Canal, of which a large proportion is rice, were very good, and the area of cultivation in the Shikárpur táluka is steadily increasing. A small portion of the juári crop suffered from rain which fell early in July, and some portion of the crops in the Sukkur táluka was flooded from the breach in the Sukkur-Begári bund: the damage done however was compensated by the rabi which was grown on the flooded land. The kharíf area irrigated was 42,158 acres and the

Sind Canal.

rabi area 7,799 acres: the cost of maintenance and repairs was Rs. 20,137, and the total expenditure against revenue Rs. 35,351.

26. Although the river was unusually high all through the inundation and the dhand from which the canal draws its supply was in good order, yet the supply was only just sufficient for the crops, and had the river been lower there would have been a deficiency. The cause of this is the increased area of rice which is now grown, and if any increased area of cultivation is to be expected it will be necessary to widen the canal in the first 12 miles, to throw the spoil banks back in places and to strengthen them, and to build masonry sluices to most of the kurriah heads. It will also be advisable to take over the Mungarwáh and Mirwáh, two important branches at the tail, which are now in the hands of zamíndárs, and if these branches be taken over and the canal be widened as proposed, there will be a large increase of cultivation. The estimate for widening the canal comes to about Rs. 41,000, but it is not advisable to spend money on improving the supply of the canal until the revised settlement comes into operation in the tálukas watered by the canal, and the men have to pay on the area they cultivate. At present the returns are very incomplete, and the extra rate of Re. 1 per acre for rice grown on wheel land makes very little difference in the receipts.

Sukkur Begári bund.

27. The Sukkur-Begári bund was in places of far too weak a section for such an inundation as that of 1882 which was 18 inches higher than any on record, and as the river was encroaching on its left bank opposite the 10th to the 15th mile, the percolation under the bund and the leaks became very serious when the river rose above 16 feet on the Bukkur gauge. There were 86 leaks altogether, 83 of which were stopped and closed with more or less difficulty, but 3 of them became breaches. The water from one breach in the 17th mile went straight to Lakhi and then to Ruk, where it was joined by the water which passed through another large breach in the 4th mile near the Ráhuja head of the Sukkur Canal. The water from this second breach took the line of the Sukkur Canal, breaching the canal and the railway line between Sukkur and Begári and between Bagári and Ruk: and the combined water from the two breaches then swept to the westward submerging all the crops between the Sind, the Mirwáh, and the Sukkur Canal, and thence passing into the Lárkhána districts. The water from the third breach fell into the Garangwáh and then joined the flood from the second breach. The bund is now being raised and strengthened throughout. The expenditure during the year was Rs. 13,436 on strengthening and Rs. 38,796 on maintenance and repairs, including establishment charges.

GHA'R CANALS.

Sukkur Canal.

28. The old head of the Sukkur Canal was after considerable trouble cleared to its proper bed level for the first time, as the canal was originally opened hurriedly and before the excavation in the first 3 miles was completed. The work progressed but slowly, for the rock cutting in the first mile was far in excess of what was expected, amounting in all to upwards of 290,000 cubic feet, and the greater part of the work lay below spring level and could only be kept clear of water by constant baling and pumping. By the 13th June, however, the work was completed, and water was admitted through the Ráhuja head.

29. The syphon which carries the water of the Garangwáh under the canal in the 7th mile had been constructed originally at a wrong level, and when the Sukkur Canal was cleared to its proper bed level the syphon, which is an iron tube, had to be lowered about 15 inches. Before this work was properly completed the zamíndárs on the Garangwáh opened that canal suddenly without orders, and the syphon, which was very much corroded, collapsed. Shortly after this happened water found its way behind both wing walls of the Ráhuja regulating head; the leak under the right wing was closed without much difficulty, but the left wing walls both gave way and fell bodily into the canal. This breach was closed with difficulty but successfully, and there was every prospect of a very good season on the canal, when a breach occurred on the 31st July in the Sukkur-Begári bund near the head. The water from this breach, which soon became about 60 feet deep, crossed the canal and breached the railway embank-

ment between Sukkur and Ruk: and on the 9th August the railway line was again breached between Ruk and Madeji by water which had crossed the canal between Sukkur and Ruk and which now re-crossed the canal in the 21st mile from left to right.

30. Attempts were made by the zamíndárs to keep the flood water off their lands by strengthening the embankments of the Alibhar and Sind Sanri, but these embankments gave way on the 11th August, and all the land along the right bank of the canal as far as the Khaire-jo Kur was submerged, with the exception of about 500 acres between the 33rd and 38th miles which was protected by bunds. The water spread along the right bank of the Khaire-jo Kur to about the 10th mile. On the left bank of the Sukkur Canal the whole country was submerged from the 2nd to the 30th mile, below which about 1,200 acres were saved by a protective bund extending from the tail of the Faizdaryawáh to the 35th mile of the canal. From this point the flood touched the canal to the 42nd mile and the water then fell into the Nasratwáh. Beyond this the flood remained from 3 to 4 miles from the Sukkur Canal until it fell into the Shahji Kur opposite mile 53. There were altogether 106 breaches in the canal banks varying in width from 10 to 700 feet. The total area of the crops destroyed on the canal was about 10,700 acres, but a good deal of this was afterwards sown with rabi crops, and there was a large area of rabi grown on the flooded lands and watered by the cold weather supply which was passed down the canal for the first time.

31. Notwithstanding the serious difficulties the canal had to contend with there is a great improvement in the returns for 1882-83 over those of any previous year, as will be seen from the following figures:—

	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1879-80	40,823	14,005	54,828	91,104	17,294	1,08,398	2·23	1·23	1·97
1880-81	54,649	4,172	58,821	1,05,162	5,192	1,10,354	1·92	1·24	1·87
1881-82	63,165	3,139	66,304	1,16,823	3,825	1,20,648	1·91	1·22	1·82
1882-83	56,024	17,259	73,283	1,41,575	29,515	1,71,090	2·53	1·71	2·33

It is almost impossible to make any proper comparison between the crops of the year under report and those of former years, owing to the way in which the returns are kept by the revenue people, as if the kharíf crop is flooded and the land is cultivated again during the rabi the kharíf assessment is levied and entered as kharíf, while the area cultivated is entered as rabi. In flood years therefore all the irrigation returns are upset, and the totals can alone be used. The result for the year however is that while the area cultivated was only 7,000 acres more than in the previous year, the net revenue is in excess by over half a lákh of rupees, though Rs. 2,082 were given as remissions and there were more in the previous year. The increase is partly due to the introduction of the revised settlement in the Rato-dero táluka which is watered by the Khaira Kur, Ghári Sind, and Bira Kur, and partly due also to the extra rate of Re. 1 per acre which has for the first time been levied on rice grown on land assessed for dry-crops. There were 4,732 acres less of rice, 2,409 acres less of dry-crops, and 14,120 acres more of rabi than in the previous year: but as was said before these areas are not to be depended on. Supposing, however, the returns to be correct and the full and proper assessment paid, the revenue ought to have been Rs. 1,94,088 instead of Rs. 1,71,090.

32. The expenditure on maintenance and repairs, the greater portion of which was for clearing the old head, was Rs. 43,470: the establishment and revenue charges were Rs. 7,656 and Rs. 6,628, making a total against revenue of Rs. 57,754. The irrigation share of land revenue collected together with hakaba and miscellaneous receipts came to Rs. 67,058: the balance of net revenue, after deducting indirect charges (Rs. 1,051), was therefore Rs. 8,253 as shown in the abstract of the administrative accounts for the year. The interest

charges for the year were Rs. 49,597, and the net loss during the year was Rs. 41,344. The levy of the proper rates of assessment, as noted in the last paragraph, would have reduced this net loss to Rs. 18,346. The percentage of expenditure on revenue was 37·29 and the cost of maintenance per acre Rs. 0·78. The discharge of the canal and the duty per cubic foot has not been entered in Table VIII. as the floods rendered the figures quite useless.

Ghár.

33. At the commencement of the inundation the river was encroaching rather seriously at the mouth of the Ghár and a good deal of silt was deposited in the first few furlongs: but the change which had been anticipated in the main current of the river occurred about the middle of July when the river rose to its full height, and the whole of the silt was swept away. The danger then became however not of too little water but of too much, as the canal could not carry the body of water which was entering at such an unusual depth, and had it not been for 3 large breaches in the left bank at the 6th mile, which allowed the greater part of the surplus water to pass back into the river, the damage done by breaches down the canal would have been most serious. As it was, however, the supply all down the canal was good, being neither in excess nor deficient. The cultivation on some of the branches on the right bank, namely, the Nasrat and Kado and Shahji Kur, was flooded from the breaches in the Sukkur-Begári bund, and remissions to the extent of Rs. 27,989 had to be granted: but notwithstanding this the area of cultivation was 12,000 acres and the net assessed revenue Rs. 96,616 more than in the previous year. The figures for the past four years are:—

	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1879-80	171,863	30,428	202,291	4,45,739	46,334	4,92,073	2·60	1·52	2·43
1880-81	199,985	16,459	216,444	4,89,785	24,644	5,14,429	2·45	1·50	2·38
1881-82	182,043	26,223	208,266	5,72,600	55,467	6,28,067	3·14	2·11	3·01
1882-83	207,700	22,565	230,265	6,52,300	72,383	7,24,683	3·14	3·21	3·14

The increase in the revenue since 1879·80 is due principally to the introduction of the revised settlements in the Labdarya, Lárkána, Kambar and Rato-dero tálukas which came into force in 1881-82 and 1882-83. There has been a slight rise in the rates of assessment all through, but the increased revenue is due to the fact that under the revised settlement the men pay on what they cultivate, whereas under the old settlement they paid on an imaginary area. A rate of under Rs. 2½ all through as in 1879-80 for such a canal as the Ghár, where the supply is so good and the principal crop is rice and the best rice in Sind, was much too low, and was below the average fixed on the area which was supposed to be cultivated each year. The principal increase of revenue over that of the previous year occurred on the Nurwáh in Kambar where the net assessed revenue on 37,076 acres was Rs. 1,16,524, that for the previous year on 40,229 acres being only Rs. 78,081: there was an increased area of cultivation of 5,292 acres and an increase of net revenue of Rs. 15,642 on the Shahji Kur which was cleared at Government expense and worked remarkably well: and there was also an increased revenue of Rs. 11,993 on the Dateji Kur.

34. The expenditure on maintenance and repairs was Rs. 71,656, and the cost of establishment and revenue charges Rs. 13,219 and Rs. 51,390, making a total of Rs. 1,36,265. The irrigation share of net assessed revenue with hakaba and miscellaneous collections was Rs. 6,56,735, the percentage of expenditure on revenue was 20·75 and the cost of maintenance per acre Rs. 0·58. As in the case of the Sukkur Canal the breaches in the 6th mile upset all the calculations of discharges, and no figures have accordingly been entered in Table VIII.

Nára.

35. The mouth of the Nára was in excellent order during the inundation and water was flowing all through the cold season; and as the river has practically ceased to encroach at its mouth, it will probably remain in good order for many years to come. Up to

the early part of July everything promised well for the cultivation, as the Mundarwáh and Gul Muhammadwáh, two important branches on the right bank in the Nasirabad and Mehar tálukas, had been taken over in the previous working season and thoroughly cleared, and there was an ample supply in the Nára for all requirements. But on the 10th July heavy rains commenced, and on the 13th the hill floods swept across the portion of the Mehar táluka not protected by the Supri bund, and almost the whole of the land on the right bank in the Kakar táluka was submerged. Shortly after this, that is, on the 25th July, floods from the river came through the old breaches in the Ábád Hatri bund and through the whole bund in fact, passed over the Gillespiewáh, and after crossing the Nára ran through the railway line near Badra, and eventually joined the hill floods near the tail of the Gul Muhammadwáh. The remissions which had to be given on account of the damage done by these floods in the Shikárpur Collectorate amounted to Rs. 35,664.

36. The acreage and net assessed revenue since 1879-80 are shown below :—

	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1879-80	73,690	27,615	101,305	2,28,779	54,364	2,83,143	3·10	1·97	2·80
1880-81	77,533	5,434	82,967	2,55,207	11,966	2,67,173	3·29	2·20	3·22
1881-82	104,976	21,667	126,643	3,56,823	71,002	4,27,825	3·40	3·27	3·38
1882-83	91,636	31,173	122,809	2,58,949	1,16,910	3,75,859	2·82	3·75	3·06

The kharíf and rabi areas and revenue for 1882-83 have apparently, judging by the rates, been mixed up again here as was done in the case of the Sukkur Canal, and no comparison can be made in consequence: but making use of the totals, there is a decrease of 3,834 acres of cultivation and of Rs. 51,966 of net assessed revenue. The difference in the remissions of the two years will account for Rs. 35,245 of this, and the balance Rs. 16,721 is the loss on the decrease of 3,834 acres of cultivation. Now that the mouth is in such good order, and there is a fine stream of water flowing in the canal during the cold season even when the river is at its lowest, there ought to be a large increase in the rabi crop. The cost of maintenance and repairs, including establishment (Rs. 9,029), was Rs. 57,205: and the total revenue expenditure Rs. 90,711. The percentage of expenditure on revenue was 26·30, and the cost of maintenance per acre Rs. 0·69.

Wáhur.

37. The Wáhur is still in three portions, and as the river is still encroaching in the direction of Magsi, it is quite useless attempting to unite these portions again. Owing to the height of the river however there was no deficiency of water, but on the contrary the cultivators had rather more than they required, for the river overtopped its banks opposite Magsi between the second and third portions of the canal, and they had to construct a bund in the flowing water to save their crops. The Máruiwáh still takes its supply from a backwater near Sita, and it worked well during the season; though in a low inundation the supply will probably be deficient, and it will probably be necessary before long to change the head. The cultivation and revenue on these canals were about the average, and no special remarks are required.

Márui.

Bunds, right bank.

38. The first of the bunds which are classed as "bunds, right bank" is the Syudabad bund, which extends from Sukkur to Bagarji, the first station on the line below Sukkur. This bund was breached on the 24th July in the 2nd mile owing to a sudden rush of water against it caused by the bursting of a bund which the zamíndárs had put up to protect a juári crop between the river and the bund. The damage caused by the breach was unimportant, as shortly after it occurred the flood from the breach in the Sukkur-Begári bund came across the Sukkur Canal, topped the Syudabad bund in the 5th and 6th miles, and flowed into the river again. The flood water from the breach in the Sukkur-Begári bund was also higher behind

the Jhali bund, the second on the list, which extends from Bagarji to the mouth of the Ghár, than it was in front of it, and two breaches were made in the bund purposely in the 8th and 9th miles to allow the water to escape back into the river. The bund was eaten away for about a mile by the river in September in the 3rd and 4th miles, and water came against the loop line which was constructed 3 or 4 years ago when the river then threatened to encroach. At the tail of the bund where it joins the Ghár bank the rate of encroachment by the river was so rapid that men had to be called out under the Irrigation Act to throw up a protective line behind: but the bund was not cut away until the river was below ground level and all danger of a flood was past. At present the river is encroaching opposite the 1st mile of the Mithu bund, the third on the list, which runs from the mouth of the Fordwáh to the north, and a loop line will probably have to be constructed there before long, as the river is now only about 500 feet off. The Phulu bund, the 4th on the list, extending from the Fordwáh to the mouth of the Nára, remained staunch. The A'bád Hatri bund, the 5th on the list, extending from the Nára mouth to opposite Badra, was practically swept away, as it had been allowed to fall into a state of disrepair owing to water not having touched it for some years: it has now been put into thorough repair. The Naugeshah bund, the 6th on the list, extending from opposite Badra to opposite Radhan, although it was severely tried, remained staunch owing to the exertions of the Abkalani establishment and the assistance rendered by the zamíndárs from the neighbourhood. The Rukan bund, the 7th on the list, extending from opposite Radhan to opposite Phulji road, remained staunch, but some portions of it, especially in the 3rd and 4th miles, are weak, and as the river threatens to encroach there before long, these portions are being repaired and strengthened.

THAR AND PA'RKAR.

Eastern Nára Canals.

39. Treating the Nára works as a whole there was a decrease in the area of cultivation and in the net assessed revenue, and the latter is the smallest in the last 7 years and about half a lákh of rupees below the average. The figures for the past 4 years are—

	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1879-80 ...	56,764	33,397	90,161	1,22,673	570,07	1,79,680	2·16	1·71	2·00
1880-81 ...	55,376	44,365	99,741	1,11,248	83,867	1,95,115	2·01	1·89	1·96
1881-82 ...	69,002	18,869	87,871	1,43,471	30,965	1,74,436	2·08	1·64	2·00
1882-83 ...	59,389	15,948	75,337	1,09,281	25,946	1,35,227	1·84	1·64	1·79

There was a decrease of 12,534 acres of cultivation and of Rs. 39,209 of net assessed revenue as compared with the previous year: the remissions in 1882-83 were Rs. 13,476 as against Rs. 2,504 in 1881-82, and the balance Rs. 28,237 represents the loss of revenue on the decreased area of 12,534 acres. The greater portion of the decrease in the kharíf occurred on the Mithrau Canal, and the rest occurred on the flooded lands of the Nára. The expenditure on the maintenance and repairs of the whole of the works was Rs. 45,095, which is about the average: the cost of establishment and revenue charges came to Rs. 10,929 and Rs. 13,479, making the total revenue expenditure Rs. 69,503. The percentage of expenditure on revenue was 48·85 and the cost of maintenance per acre Rs. 0·92. These figures are much higher than those for the previous year, and are above the average.

Mithrau Canal.

40. On the Mithrau Canal there was a decrease in both kharíf and rabi as compared with previous years and with 1881-82, and the net assessed revenue of both is the smallest of the whole series. The figures for the past four years are—

	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1879-80 ...	51,316	20,529	71,845	1,07,868	32,450	1,40,318	2·10	1·57	1·95
1880-81 ...	50,292	22,357	72,649	1,01,421	33,875	1,35,296	2·01	1·51	1·86
1881-82 ...	58,991	8,568	67,559	1,20,587	13,821	1,34,408	2·04	1·61	1·99
1882-83 ...	49,825	7,168	56,993	91,094	11,602	1,02,696	1·83	1·62	1·82

As compared with the previous year there is a decrease of 9,166 acres of kharíf cultivation and Rs. 29,493 of net assessed revenue: and a decrease of 1,400 acres of rabi and Rs. 2,219 of net assessed revenue: the remissions for the kharíf were Rs. 11,458, given on account of the damage done by rats, and for the rabi Rs. 116, of which Rs. 82 were given on account of damage done by insects and by the weather. The decrease in the area of rice crop was 3,620 acres, and of bájri 4,963 acres. As was explained in last year's report, there must always be a variation from year to year in the areas irrigated, both kharíf and rabi, until the protective embankment to the canal is completed and the supply during the rabi is ensured. The protective embankment is well in hand, and by the inundation of 1884 it will probably be completed as far as the Samara dhand, that is, for about 56 miles; and as this will protect a very large area of land, the cultivation during the kharíf should show a considerable increase. For 1883-84 there has been an increase of about 10,000 acres of kharíf, and in 1884-85 the increase will be still larger.

41. The expenditure on maintenance and repairs was only Rs. 17,075, and including establishment and cost of revenue collection, the total expenditure against revenue was Rs. 30,398. The percentage of expenditure on revenue was 32·59 and the cost of maintenance per acre Rs. 0·53. The average discharge of the canal during the kharíf season was 860 cubic feet per second, and the duty 58·16 acres to the cubic foot: this is a smaller duty than was obtained in 1881-82, but as was explained in the report for that year, that was accounted for by the seasonable and high rainfall. The duty appears to have been about 46 acres of rice and 115 acres of dry-crops to the cubic foot of supply.

Thar Canal.

42. The water reached the head of the Thar Canal much earlier than in previous years, though it was still about 15 days behind the proper time, which should be the 1st of June at the latest. A portion of the Makhi weir has however now been opened out, and the mouths of several of the dhands leading from the Nára have been closed, and in future years the supply will probably reach the head of the canal at the proper time. As compared with the previous year there was a decrease of 149 acres of cultivation, and an increase of Rs. 750 of net assessed revenue: the figures for the four years being—

	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1879-80 ...	1,681	1,485	3,166	3,767	1,554	5,321	2·24	1·05	1·70
1880-81 ...	1,041	4,151	5,192	1,916	6,088	8,004	1·84	1·47	1·54
1881-82 ...	4,832	4,467	9,299	10,553	6,597	17,150	2·18	1·47	1·84
1882-83 ...	7,286	1,864	9,150	15,502	2,398	17,900	2·13	1·28	1·95

There was an increase in kharíf of 2,454 acres, and a decrease in rabi of 2,603 acres as compared with the previous year. The increase in the kharíf is due partly to the earlier arrival of the water, and partly to the increased confidence gained by the people in the stability of the protective embankment which is now very nearly completed. The causes of the decrease in the rabi are not known.

43. The expenditure on maintenance and repairs was Rs. 10,631, and including establishment and cost of revenue collection, the total expenditure

against revenue was Rs. 14,815. The percentage of expenditure on revenue was 90·60 and the cost of maintenance per acre Rs. 1·55. No discharges were taken as only parts of the branches were open during the year, and the canal is not yet in proper working order.

44. The other two canals, the Dimwáh and Heranwáh, call for no special remark. The former produced a net revenue of Rs. 2,151 off 1,130 acres of cultivation, and the revenue expenditure on it was Rs. 2,343 : the latter produced a net revenue of Rs. 249 off 136 acres, and the revenue expenditure was Rs. 277. Taking the Eastern Nára works as a complete project, the balance of net revenue during the year was Rs. 68,234 : the interest charges during the year were Rs. 1,47,087 : and the net deficit was Rs. 78,853. At the end of the year there was a balance of net interest charges against the works of Rs. 10,23,706 : but when the protective works are completed, and the land recovers from the floods of past years, this balance will soon be paid off.

HYDERABAD COLLECTORATE.

Hyderabad Canals.

45. The inundation was a favourable one for this district, which comprises the northern half of the Hyderabad Collectorate, as the land is high and seldom touched by a flood. Unfortunately the Nasratwáh was unable to carry the water delivered at such an unusually high level of the river, and its banks were breached in all directions, and the greater part of the Kandiáro táluka was under water. Out of a total of kharíf remissions for the whole division, amounting to Rs. 18,625, no less than Rs. 17,158 were given in this táluka alone : the rabi crop however which was grown on this flooded land much more than compensated the damage done during the kharíf, and there was no eventual loss. In all the southern tálukas the supply was excellent, and the canals all continued to flow to a late date, especially the ones taking off from the Mahumda Gháro. Notwithstanding the high and favourable inundation and the increased area of cultivation, the figures which have been given by the Collector in Canal Return VIII. as representing the consolidated revenue off that cultivation, show a very large falling off as compared with the previous years. The figures for the past four years are—

	Cultivation.			Net Consolidated Revenue.		
	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Total.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.
1879-80... ...	273,543	15,914	289,457	6,31,198	28,287	6,59,485
1880-81... ...	241,686	8,356	250,042	5,91,916	20,164	6,12,080
1881-82... ...	259,899	17,188	277,087	7,57,286	21,942	7,79,228
1882-83... ...	262,135	30,015	292,150	6,07,722	85,617	6,93,339

Compared with the previous year there was in the year under report apparently an increase of 15,063 acres of cultivation and a decrease of net consolidated revenue of no less than Rs. 85,889. In reality however there was an increased revenue of Rs. 32,083, less ordinary remissions, which leaves a balance in favour of 1882-83 of Rs. 13,715 : and the whole complication has arisen from the fact that in 1881-82 fallows were entered and charged as regular revenue in the Kandiáro, Naushahro, Moro, Sákrand and Shahdádpur tálukas, while in the returns for 1882-83 the fallows are only entered and charged as revenue in the first three tálukas, and are not brought into account at all for the rest. The fallows of 1881-82 were largely in excess of those of 1882-83, as a large quantity of land was thrown up in the latter year when the zamíndárs found that they would be called upon to pay revenue on those lands, and the order remitting the revenue on fallows was not issued until the jamábandi of 1882-83 was being closed, and was too late to prevent the charges being included for some of the tálukas. The following table showing the fallow lands for which revenue was charged, but has since been remitted, will explain what is meant :—

	1881-82.	1882-83.	Remarks.
	Acres fallow.	Acres fallow.	
Kandiáro táluka	40,399	27,617	
Naushahro „	38,358	28,334	
Moro „	15,549	9,365	
Sákrand „	30,872	...	Fallows in these two tálukas not included in the jamábandi of 1882-83.
Shahdádpur„	14,945	...	

All the revenue which has been charged on these fallow lands as shown above has now been remitted, and the consolidated revenue of 1881-82 and of 1882-83 will be considerably reduced, and amended Canal Return VIII. for these years will have to be submitted if the irrigation tables are to be correct. After this season the complication cannot arise should the revenue from fallow lands not be collected: but if this be not the case, then in future a separate head should be included in Canal Return VIII. showing what the actual revenue on the year's cultivation is, what fallow lands have been included, and what the revenue on those lands is. The simplest plan, however, will be to omit these fallow lands altogether from the return, as the return is intended to show only the actual cultivation of the year and the consolidated revenue assessed on that area: and it is rather difficult to understand why this has not been done before. As the figures are altogether incorrect, it is useless attempting to make any detailed comparisons as was done in last year's report.

46. Of the three canals in the division for which capital and revenue accounts are kept, namely the Alibhar Kacheri, the Márak, and the Sarfráz, the first produced a net revenue, after paying all revenue and interest charges, of Rs. 1,965; the second a surplus of Rs. 38,242; and the third showed a deficit of Rs. 2,335. But the capital expenditure on the Sarfráz, as was explained in last year's report, was incurred for the purpose of preserving the existing revenue and not to give any large increased receipts, and the expenditure ought properly to have been charged to revenue. When, however, the revised settlement comes into force in the tálukas watered by this canal the returns will show better, and the assessment will more than cover all the charges and leave a surplus. Taking all the canals in the district together the expenditure on maintenance and repairs was Rs. 1,50,611: the cost of establishment and revenue collection was Rs. 36,113 and Rs. 54,324: and the total charges against revenue were Rs. 2,41,048: the percentage of expenditure on revenue was 37·56 and the cost of maintenance per acre Rs. 0·72. A few of the canals are entered in Table VIII, but the duty is so absurdly low, considering that the whole of the cultivation is dry-crop, that there is probably something wrong either with the area of cultivation or with the discharge.

FULELI CANALS.

47. For all the high lands in this district, which comprises the southern half of the Hyderabad Collectorate, the season was a most favourable one, and had it not been for the heavy rainfall in July, it would have proved in the main also a favourable one for the low lands. But a good deal of harm was also done to the low lands at the tail of the Guni by the surplus water swamping them when the early rise occurred in April, owing to there being no escapes. On the Fuleli itself and branches there was a decrease of both cultivation and revenue, and on the other canals there was a slight increase. The figures for the four years are—

		Cultivation.			Net consolidated Revenue.			Rate per acre.		
		Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
		Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Fuleli ...	1879-80	148,743	11,067	159,810	3,36,011	13,326	3,49,337	2·26	1·20	2·18
	1880-81	154,533	4,367	158,900	3,55,088	9,959	3,65,047	2·30	2·28	2·30
	1881-82	166,037	7,209	173,246	3,71,935	10,751	3,82,686	2·24	1·49	2·21
	1882-83	144,418	10,863	155,281	3,36,099	10,866	3,46,965	2·33	1·00	2·23
Other canals	1879-80	14,325	2,148	16,473	36,634	1,286	37,920	2·55	0·60	2·30
	1880-81	14,764	395	15,159	34,418	743	35,161	2·33	1·88	2·32
	1881-82	14,619	424	15,043	35,865	918	36,783	2·45	2·16	2·44
	1882-83	15,754	1,067	16,821	34,276	1,061	35,337	2·17	1·00	2·10

On the Fuleli and its branches there was a decrease of 17,965 acres of cultivation and of Rs. 35,721 of net consolidated revenue as compared with the previous year. There was a decrease in the Hyderabad táluka of Rs. 4,585, due to the approaching introduction of the revised settlement: in the Mohbat Dera táluka there was a decrease of Rs. 4,543, due to remissions amounting to Rs. 2,831, and to lands at the tail of the Imámwáh Jánobi having been thrown out of cultivation owing to want of clearance and to increase of cultivation in the upper portions of that canal: and in the Guni, Badin, and Bágo Tando tálukas the decreases were Rs. 6,804, Rs. 15,053 and Rs. 6,005. Remissions amounting to Rs. 12,685 in the Guni táluka, of which Rs. 6,046 are for the Fuleli and branches, have not been included in the accounts of the year, as was before explained, owing to their not having been finally approved by the Commissioner in Sind until after its close.

48. The decreases above noticed are due to three main causes. First, a decreased area of rice cultivation owing to lands having been flooded by the rise of the river in the early part of the season: secondly, to rice cultivation being flooded either by rain or canal water: and thirdly, to damage done by rats. The greater part of the damage was caused by rain, as in a few days in the early part of July as much as 12·22 inches fell at the Tando, and this abnormal rainfall filled up all the low grounds, flooding cultivation in some cases and in others preventing them being put to their usual use as escapes for the drainage from the rice fields on the higher lands surrounding them. The rice cultivation in these districts is in many cases carried on in saucer-like depressions. On the edges a description of rice requiring but little water is grown: lower down another description is grown requiring more water: and the centre is left to take up the drainage from the edges. If this depression in the centre gets filled by rain, the whole system fails. As regards the damage caused by canal water, the early rise in April when there was no demand for water and when most of the branch canals were closed for clearance, caused a great pressure on the tail branches which were open, and many breaches occurred. Again in July and August, during the heavy falls of rain, the cultivators at once closed their kurriahs, and, as usual, breaches occurred. These breaches were closed as soon as the rain ceased and irrigation was resumed; but in the absence of escapes breaches occasionally cannot be avoided; and as all the old drainage channels have been interfered with more or less by canals carried across them, it is difficult to devise remedies. Surveys are, however, now being made, and, if any escapes are found to be feasible, projects will be drawn out and be submitted for sanction.

49. On the other canals there was an increase of 1,778 acres of cultivation and a decrease of Rs. 1,446 of net consolidated revenue as compared with the previous year. The decrease of revenue is mainly due to breaches in the Hajipur bund which were caused by a very sudden rise in the Indus of 7 feet, owing to a heavy rain flood down the Baran river which joins the Indus about 6 miles above the north end of the bund. This bund was thoroughly repaired last working season. Taking all the canals in the district together, the cost of maintenance and repairs was Rs. 1,30,229, and the total revenue expenditure, including Rs. 37,607 for establishment and Rs. 17,599 for revenue collection, was Rs. 1,85,435: the percentage of expenditure on revenue was 50·87, and the cost of maintenance per acre Rs. 0·88. The Fuleli and a few of its branches have been entered in Table VIII. The duty for the Fuleli as a whole

is only 23·95 acres to the cubic foot, but a low duty was to be expected as there was a superabundance of water and a decreased area of cultivation. The low duty of the Sanhi Guni, Sherwáh, and Aliwáh is due to the large quantity of water which escaped through breaches and through their tails into the Purandhora which flows into the sea at Lakhpat: and they have been entered in the statement merely as an illustration of the causes which led to such a low duty on the Fuleli as a whole.

KARA'CHI COLLECTORATE.

Karáchi Canals.

50. The principal things to be noted as regards this district, which comprises the whole of the Kárachi Collectorate, are the great damage done by the heavy rain which fell in July, and the abnormal rise of the river in August which breached nearly every one of the river embankments on both banks south of Jerruck, and caused a great deal of damage to the canal banks. The actual quantity of rain that fell was not unusual taking the total rainfall into consideration, but it nearly all fell in two days, *viz.*, on the 11th and 13th July, and the hill torrents came down so rapidly and in such heavy flood that large areas of crops on all low lands between the hills and the river were destroyed, and the river below the junction of the Baran was raised suddenly about 7 feet in less than 24 hours. South of Jerruck the river embankments on both banks were topped or turned by the flood, and the greater part of the districts on both banks was submerged. The remissions were in consequence very heavy, amounting to no less than Rs. 1,00,291 for the kharíf, and the canals on which the principal remissions were given were—

	Rs.
Western Nára	20,172
Kalri	8,426
Baghar	2,670
Canals in Tatta	7,345
Pinyári	39,397
Canals in Mirpur Batoro	3,837
Canals in Sujáwal	3,711
Total ...	85,558

51. The remissions on the Nára, which includes the Aral and Manchar, were due partly to the flood which left the river in the Labdarya táluka and entered the Dádú táluka at Deh Phulji; partly to rain floods from the hills; and partly to the river flood which extended north of Sehwan as far as Bilawalpur. The remissions on the Kalri were due entirely to flooding caused by overflow of canals from rain and the high inundation, and to floods from the river through the Shah Lauka forest on its north bank near its mouth. The lands on the Baghar and Uchita were flooded from the river through the Bákráni and Babralo bunds. The remissions on the Pinyári were due to flooding from breaches and rain, and also to flooding from the river. The bunds in the Sháhbandar districts were breached all over, and in many places were swept completely away, and this accounts for nearly all the remissions in the districts on the left bank south of Jerruck, as only about Rs. 1,500 were remitted on account of damage done by rats and disease in rice seedlings.

52. Where the flooding was so universal there is no object in treating the canals in detail, and a comparison of the results for the whole division will be sufficient. The figures for 1881-82 and 1882-83 are—

	Cultivation.			Net Consolidated Assessment.		
	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Total.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.
1881-82 ...	183,207	33,300	216,507	4,89,705	1,27,868	6,17,573
1882-83 ...	185,935	61,852	247,787	3,53,386	1,42,903	4,96,289
Difference ...	+ 2,728	+ 28,552	+ 31,280	- 1,36,319	+ 15,035	- 1,21,284

Had the Shâhbandar districts been under the settlement, it is probable that the revenue derived from the rabi crop grown on the flooded lands would almost if not quite have made up for the loss on the kharíf: but unfortunately the whole of the land is held under lease, under which no extra assessment can be imposed; and if Rs. 50 is the sum entered in the lease as the assessment for the rabi crop, the lease-holder may cultivate 10,000 acres if he likes and still pay only Rs. 50 for it. There were thousands of acres of rabi all over the district and the assessment levied was a mere nothing.

52. The whole line of bund on the left bank from opposite Jerruck to the mouth of the Kokowari in the latitude of Moghul Bhin has now been restored and made of a proper height and section, and all danger of flooding for the future is removed. The bunds on the right bank are being repaired and strengthened: and when the whole is in proper condition, and the settlement is introduced, such serious losses as occurred in the year under report cannot again take place.

J. LEMESURIER, Colonel, R.E.,
Superintending Engineer for Irrigation in Sind.

Camp Begári Mouth, 10*th January* 1884.

TABLE I.

Cultivation and Water Share of Net Consolidated Revenue for 1882-83 *and three previous years.*

Executive Charges.		1879-80.		1880-81.		1881-82.		Average.		1882-83.	
		Acres.	Revenue.	Acres.	Revenue.	Acres.	Revenue.	Acres.	Revenue.	Acres.	Revenue.
			Rs.		Rs.		Rs.		Rs.		Rs.
Begári Canals	Desert Canal	66,858	1,11,437	59,227	96,620	62,645	1,04,174	62,910	1,04,077	71,869	1,18,901
	Begári Canal	56,743	98,555	49,935	91,143	75,823	1,32,180	60,834	1,07,293	103,532	1,87,985
	Kashmor Bund	....	....	....	....	....	....	....	....	645	1,144
Shikárpur Canals	Canals in Rohri	34,275	80,323	36,040	87,043	46,232	1,06,134	38,849	91,167	51,348	1,09,472
	Bunds in Rohri	3,290	7,347	3,400	7,340	3,540	7,280	3,410	7,322	3,821	7,244
	Sind Canal	43,388	1,05,389	44,429	1,05,289	47,919	1,24,521	45,245	1,11,733	49,957	1,15,266
	Sukkur-Begári Bund	....	....	....	....	....	....	....	....	....	....
Ghár Canals	Sukkur Canal	54,828	97,558	58,821	99,319	66,304	1,08,583	59,984	1,01,820	73,283	1,53,981
	Ghár	202,291	4,42,866	216,444	4,62,986	208,266	5,65,260	209,000	4,90,371	230,265	6,52,215
	Nára	101,395	2,54,829	82,967	2,40,456	126,643	3,85,043	103,639	2,93,442	122,809	3,38,273
	Wáhur	6,847	24,058	7,544	24,013	7,823	20,595	7,405	22,869	9,677	22,337
	Márui	5,149	11,040	4,061	11,733	3,887	12,031	4,366	11,601	3,698	10,237
	Bunds, Right Bank	928	2,401	756	1,792	93	180	592	1,458	12	41
Eastern Nára Canals.	Nára Supply Channel	19	42	283	831	278	768	193	547	62	138
	Eastern Nára	15,036	30,870	20,934	44,608	9,873	18,232	15,281	31,070	7,866	10,630
	Mithrau Canal	71,845	1,26,286	2,649	1,21,766	67,559	1,20,967	70,684	1,23,006	56,993	92,426
	Thar Canal	3,166	4,789	5,192	7,204	9,299	15,435	5,896	9,143	9,150	16,110
	Dimwáh	....	....	676	1,183	821	1,513	499	899	1,130	2,151
	Heranwáh	95	225	7	12	41	78	48	105	136	249
Hyderabad Canals.	Mehrabwáh	11,822	23,843	9,247	18,971	8,095	28,751	9,721	23,855	11,644	27,942
	Nasrat	12,746	29,832	7,709	30,956	12,776	58,298	11,077	39,695	22,651	59,315
	Naolakhi	44,657	1,06,182	33,063	78,277	34,305	1,06,817	37,342	97,092	40,171	1,09,302
	Dámbro	7,609	16,291	6,084	15,799	5,852	17,078	6,515	16,389	5,627	16,073
	Lád	17,948	39,600	14,662	41,046	18,522	55,310	17,044	45,319	19,245	44,929
	Rein	11,910	27,044	11,092	25,802	10,213	28,407	11,072	27,084	10,339	21,603
	Alibahr Kacheri	7,413	16,002	6,819	13,992	8,112	19,800	7,448	16,598	7,835	15,264
	Márak	41,583	90,763	39,907	91,104	43,010	1,09,914	41,500	97,261	41,084	91,514
	Gharo Máhmuda	44,990	87,960	39,222	84,579	42,778	88,144	42,330	86,894	41,681	79,947
	Kari Shumáli	26,382	41,748	23,866	39,423	27,683	42,892	25,974	41,354	27,942	38,687
	Nasir	25,611	40,726	23,930	40,338	25,972	41,010	25,171	40,691	25,021	40,347
	Sarfráz	15,664	23,602	17,805	25,550	20,661	26,006	18,043	25,053	17,704	24,824
	Other Canals	21,122	49,944	16,644	45,035	19,108	61,551	18,958	52,173	21,206	54,258
Fuleli Canals	Fuleli	159,810	3,14,403	158,900	3,28,542	173,246	3,44,417	163,986	3,29,121	155,281	3,12,269
	Other Canals	16,473	34,128	15,159	31,645	15,043	33,105	15,558	32,959	16,821	31,803
Karáchi Canals	Nára	50,817	1,02,695	82,232	1,68,454	56,487	1,92,229	63,179	1,54,459	72,353	1,48,245
	Phitta	4,863	8,317	11,423	19,175	5,534	26,773	7,273	18,088	5,912	13,730
	Canals north of Kotri	11,950	17,616	12,407	23,901	10,121	26,436	11,493	22,658	13,877	28,903
	Kalri	10,649	22,046	8,504	21,316	8,331	21,499	9,161	21,620	9,728	19,054
	Baghár	14,096	25,871	10,739	25,513	12,601	28 072	12,479	26,485	15,971	30,516
	Uchita	14,301	36,472	15,735	39,004	13,812	31,804	14,646	35,760	12,315	29,643
	Canals in Tatta, &c.	6,422	13,893	6,813	15,573	7,425	15,998	6,887	16,155	8,234	12,515
	Pinyári	51,129	1,06,744	49,800	1,13,783	52,525	1,07,276	51,151	1,09,268	54,268	77,812
	Canals in Mirpur Batoro	8,777	21,074	9,403	20,598	9,738	20,454	9,306	20,709	9,694	15,651
	Canals in Sujáwal	6,695	12,323	5,563	12,430	5,796	12,029	6,018	12,261	10,738	8,808
	Satta	8,618	17,205	5,942	16,731	7,432	18,136	7,331	17,357	8,425	16,621
	Canals in Jati	3,072	4,122	1,369	4,382	1,591	4,095	2,011	4,193	1,725	3,222
	Khánta	4,740	11,541	4,745	11,149	6,162	11,788	5,215	11,493	6,393	9,761
	Kokowári	11,655	26,175	13,941	30,544	15,999	32,814	13,865	29,844	15,138	26,120
	Canals in Shahbandar	2,184	4,274	1,960	4,362	2,203	4,628	2,115	4,421	2,471	4,482
	Bunds, Left Bank	892	2,134	620	1,775	750	1,765	754	1,891	458	1,445
	Bunds, Right Bank	....	....	....	....	....	....	....	....	87	132
Begári Canals		123,601	2,09,992	109,162	1,87,763	138,468	2,36,354	123,744	2,11,370	176,046	3,08,030
Shikárpur Canals		80,953	1,93,059	83,869	1,99,672	97,691	2,37,935	87,504	2,10,222	105,126	2,30,962
Ghár Canals		371,348	8,32,752	370,593	8,40,299	413,016	10,91,632	384,986	9,21,561	439,744	11,77,084
Eastern Nára Canals		90,161	1,61,712	99,741	1,75,604	87,871	1,56,993	92,591	1,64,770	75,337	1,21,704
Hyderabad Canals		289,457	5,93,537	250,042	5,50,872	277,087	6,33,978	272,195	6,09,462	292,150	6,24,005
Fuleli Canals		176,283	3,48,531	174,059	3,60,187	188,289	3,77,522	179,544	3,62,080	172,102	3,44,072
Karáchi Canals		210,950	4,32,502	241,196	5,28,670	216,507	5,55,816	222,884	5,05,662	247,787	4,46,660
	Total	1,342,753	27,72,085	1,328,662	28,43,067	1,418,929	33,40,230	1,363,448	29,85,127	1,508,292	32,52,517

TABLE II.

Area of Cultivation and Canal Revenue for 1882-83 *and five previous years.*

Year.	Cultivation.			Water Share of net Consolidated Revenue.	Hakaba.	Miscellaneous.	Total Canal Revenue.
	Government.	Jághir.	Total.				
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1877-78	1,296,065	122,798	1,418,863	26,63,996	39,596	37,026	27,40,618
1878-79	1,885,315	130,774	2,016,089	29,67,160	35,753	47,521	30,40,434
1879-80	1,342,753	111,275	1,454,028	27,72,085	41,575	39,547	28,53,207
1880-81	1,328,662	164,007	1,492,669	28,43,067	41,722	59,243	29,44,032
1881-82	1,418,929	183,057	1,601,986	33,40,230	74,828	41,966	34,57,024
Average	1,454,345	142,382	1,596,727	29,15,307	46,695	45,061	30,07,063
1882-83	1,508,292	165,001	1,673,293	32,52,517	87,057	49,789	33,89,313
Increase or Decrease	+53,947	+22,619	+76,566	+3,37,210	+40,362	+4,678	+3,82,250

J. LeMESURIER, Colonel, R.E.,
Superintending Engineer for Irrigation in Sind.

TABLE III.

Area of Cultivation and Canal Revenue for 1882-83.

Collectorates and Canals.			Cultivation. Government.	Cultivation. Jághir.	Cultivation. Total.	Water share of net consolidated Revenue as in Table VII.	Hakaba.	Miscellaneous.	Total Canal Revenue.
			Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Frontier, Upper Sind.	Begári Canals.	Desert Canal	71,869	21,915	93,784	1,18,901	15,552	113	1,34,566
		Begári Canal	103,532	36,375	139,907	1,87,985	34,466	839	2,23,290
		Works for which no Capital or Revenue Accounts are kept	645	...	645	1,144	...	321	1,465
Shikárpur	Shikárpur Canals	Canals in Rohri	51,348	776	52,124	1,08,472	359	1,423	1,10,254
		Bunds in Rohri	3,821	...	3,821	7,224	...	5	7,229
		Sind Canal	49,957	1,812	51,769	1,15,266	543	354	1,16,163
		Sukkur-Begári Bund	...	...	...	...	...	63	63
		Works for which no Capital or Revenue Accounts are kept	...	...	...	...	...	12	12
	Ghár Canals	Sukkur Canal	73,283	510	73,793	1,53,981	106	775	1,54,862
		Ghár	230,265	4,055	234,320	6,52,215	868	3,652	6,56,735
		Nára	122,809	8,084	130,893	3,38,273	2,372	3,987	3,44,632
		Wáhur	9,677	...	9,677	22,337	...	498	22,835
		Márui	3,698	...	3,698	10,237	...	...	10,237
		Bunds, Right Bank	12	...	12	41	...	20	61
		Works for which no Capital or Revenue Accounts are kept	...	...	...	...	...	64	64
Thar and Párkar.	Eastern Nára Canals.	Nára Supply Channel	62	...	62	138	47	3,433	3,618
		Eastern Nára	7,866	...	7,866	10,630	...	15,990	26,620
		Mithrau Canal	56,993	...	56,993	92,426	...	865	93,291
		Thar Canal	9,150	422	9,572	16,110	137	106	16,353
		Dimwáh	1,130	...	1,130	2,151	...	...	2,151
		Heranwáh	136	...	136	249	...	...	249
		Works for which no Capital or Revenue Accounts are kept	...	...	...	...	...	1	1
Hyderabad	Hyderabad Canals.	Mehrabwah	11,644	167	11,811	27,942	...	17	27,959
		Nasrat	22,651	606	23,257	59,315	276	315	59,906
		Navlákhi	40,171	2,630	42,801	1,09,302	973	221	1,10,496
		Dámbro	5,627	490	6,117	16,073	221	10	16,304
		Dád	19,245	4,765	24,010	44,929	2,155	390	47,474
		Rein	10,339	...	10,339	21,603	...	138	21,741
		Alibhar Kacheri	7,835	1,055	8,890	15,264	451	16	15,731
		Márak	41,084	5,580	46,664	91,514	2,126	275	93,915
		Gharo Mahmuda	41,681	10,526	52,207	79,947	3,804	831	84,582
		Kari Shumáli	27,942	7,394	35,336	38,687	1,864	350	40,901
		Nasir	25,021	2,149	27,170	40,347	576	236	41,159
		Sarfráz	17,704	3,940	21,664	24,824	944	298	26,066
		Other Canals	21,206	1,634	22,840	54,258	951	232	55,441
		Works for which no Capital or Revenue Accounts are kept	...	...	...	...	...	...	.....
	Fuleli Canals.	Fuleli	155,281	36,168	191,449	3,12,269	14,087	5,380	3,31,736
		Other Canals	16,821	2,964	19,785	31,803	744	220	32,767
		Works for which no Capital or Revenue Accounts are kept	...	...	...	...	...	32	32
Karáchi	Karáchi Canals.	Nára	72,353	2,784	75,137	1,48,245	435	4,048	1,52,728
		Phitta	5,912	653	6,565	13,730	337	279	14,346
		Canals north of Kotri	13,877	1,198	15,075	28,903	513	63	29,479
		Kalri	9,728	500	10,228	19,054	166	95	19,315
		Baghár	15,971	1,285	17,256	30,516	507	75	31,098
		Uchita	12,315	...	12,315	29,643	...	...	29,643
		Canals in Tatta, &c.	8,234	1,107	9,341	12,515	342	205	13,062
		Pinyári	54,268	1,811	56,079	77,812	611	2,062	80,485
		Canals in Mirpur Batoro	9,694	...	9,694	15,651	...	...	15,651
		Canals in Sujáwal	10,738	35	10,773	8,808	13	61	8,882
		Satta	8,425	299	8,724	16,621	103	21	16,745
		Canals in Játi	1,725	111	1,836	3,222	41	...	3,263
		Khánta	6,393	177	6,570	9,761	60	...	9,821
		Kokowári	15,138	...	15,138	26,120	...	104	26,224
		Canals in Shahbhandar	2,471	180	2,651	4,482	66	386	4,934
		Bunds, Left Bank	458	385	843	1,445	105	...	1,550
		Bunds, Right Bank	87	459	546	132	136	3	271
		Works for which no Capital or Revenue Accounts are kept	...	...	...	...	...	855	855
Begári Canals			176,046	58,290	234,336	3,08,030	50,018	1,273	3,59,321
Shikárpur Canals			105,126	2,588	107,714	2,30,962	902	1,857	2 33,721
Ghár Canals			439,744	126,49	452,393	11,77,084	3,346	8,996	11.89,426
Eastern Nára Canals			75,337	422	75,759	1,21,704	184	20,395	14,22,83
Hyderabad Canals			292,150	40,936	333,086	6,24,005	14,341	3,329	6,41,675
Fuleli Canals			172,102	39,132	211,234	3,44,072	14,831	5,632	3,64,535
Karáchi Canals			247,787	10,984	258,771	4,46,660	3,435	8,257	4,58,352
		Total	1,508,292	165,001	1,673,293	32,52,517	87,057	49,739	33,89,313

J. LEMESURIER, Colonel, R.E.,
Superintending Engineer for Irrigation in Sind.

TABLE IV.

Revenue Expenditure on New Works, Maintenance and Repairs, and Revenue Charges in Civil Department for 1882-83.

Executive Charges.		Revenue Expenditure.								Total Revenue Expenditure.			
		Improvements.			Maintenance and Repairs.			Revenue Charges in Civil Department.	Total.	Works.	Establishment.		Total.
		Works.	Establishment.	Total.	Works.	Establishment.	Total.				Public Works Department.	Civil Department.	
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals.	Desert Canal	..	..	..	8,933	2,797	11,730	9,620	21,350	8,933	2,797	9,620	21,350
	Begári Canal	..	..	..	55,203	15,456	70,659	16,347	87,006	55,203	15,456	16,347	87,006
	Kashmor Bund	84,448	12,181	96,624	48,674	7,022	55,696	114	56,819	1,33,117	19,203	114	1,52,434
Shikárpur Canals.	Canals in Rohri	..	..	..	27,925	6,177	34,102	11,007	45,109	27,925	6,177	11,007	45,109
	Bunds in Rohri	1,309	361	1,760	13,104	3,186	16,300	791	17,091	14,503	3,557	791	18,851
	Sind Canal	..	..	..	20,137	4,454	24,591	10,760	35,351	20,137	4,454	10,760	35,351
	Sukkur-Begári Bund	11,002	2,434	13,436	31,769	7,027	38,796	..	38,796	42,771	9,461	..	52,232
Ghár Canals.	Sukkur Canal	..	..	..	43,470	7,656	51,126	6,628	57,754	43,470	7,656	6,628	57,754
	Ghár	6,566	1,211	7,777	71,656	13,219	84,875	51,300	1,36,265	78,222	14,430	51,300	1,44,052
	Nára	..	..	..	48,176	9,029	57,205	33,506	90,711	48,176	9,029	33,506	90,711
	Wáhur	..	..	..	3,932	737	4,669	2,291	6,960	3,932	737	2,291	6,960
	Márui	..	..	..	1,104	207	1,311	1,022	2,333	1,104	207	1,022	2,333
	Bunds, Right Bank	11,077	2,076	13,153	27,755	5,202	32,957	4	32,961	38,832	7,278	4	46,114
Eastern Nára Canals.	Nára Supply Channel	..	..	..	4,289	1,223	5,512	18	5,530	4,289	1,223	18	5,530
	Eastern Nára	..	..	..	11,167	2,657	13,824	2,316	16,140	11,167	2,657	2,316	16,140
	Mithrau Canal	..	..	..	17,075	4,068	21,143	9,255	30,398	17,075	4,068	9,255	30,398
	Thar Canal	..	..	..	10,631	2,534	13,165	1,650	14,815	10,631	2,534	1,650	14,875
	Dinwáh	..	..	..	1,724	404	2,128	215	2,343	1,724	404	215	2,343
	Heranwáh	..	..	..	209	43	252	25	277	209	43	25	277
Hyderabad Canals.	Mehrabwáh	..	..	..	3,257	794	4,051	2,597	6,648	3,257	794	2,597	6,648
	Nasrat	..	..	..	31,674	7,719	39,393	4,663	44,056	31,674	7,719	4,663	44,056
	Naolákhi	..	..	..	30,421	7,413	37,834	9,958	47,792	30,421	7,413	9,958	47,792
	Dámbro	..	..	..	3,226	786	4,012	1,510	5,522	3,226	786	1,510	5,522
	Dád	766	187	953	4,038	1,130	5,768	4,267	10,035	5,104	1,317	4,297	11,018
	Rein	..	..	..	6,963	1,478	7,541	2,054	9,595	6,963	1,478	2,054	9,595
	Alibhar Kacheri	..	..	..	3,141	683	3,844	757	4,601	3,141	683	757	4,601
	Márak	..	..	..	8,787	1,859	10,646	6,291	16,937	8,787	1,859	6,291	16,937
	Gháro Máhmuda	..	..	..	24,267	5,914	30,181	8,493	38,674	24,267	6,014	8,493	38,674
	Kari Shumáli	..	..	..	6,957	1,822	8,279	4,011	12,290	6,957	1,922	4,011	12,290
	Nasir	..	..	..	11,879	2,894	14,773	4,194	18,967	11,879	2,894	4,194	18,967
	Sarfráz	..	..	..	8,335	1,811	10,146	1,390	11,536	8,335	1,811	1,390	11,536
	Other Canals	..	..	..	8,246	2,010	10,256	4,109	14,365	8,246	2,010	4,109	14,365
Fuleli Canals.	Fuleli	186	54	240	1,13,940	33,003	1,46,943	15,379	1,62,322	1,14,126	33,057	15,379	1,62,562
	Other Canals	..	..	..	16,289	4,604	20,893	2,220	23,113	16,289	4,604	2,220	23,113
Karáchi Canals.	Nára	22	9	31	5,889	2,302	8,190	14,903	23,093	5,910	2,311	14,903	23,124
	Phitta	..	..	..	1,610	629	2,239	1,286	3,525	1,610	629	1,286	3,525
	Canals north of Kotri	..	..	..	5,739	1,462	7,201	2,932	8,133	5,739	1,462	2,932	8,133
	Kalri	..	..	..	11,673	4,584	16,257	1,824	18,081	11,673	4,584	1,824	18,081
	Baghár	..	..	..	2,744	1,088	3,872	3,015	6,887	2,781	1,088	3,015	6,887
	Uchita	..	..	..	562	220	782	2,403	3,185	562	220	2,403	3,185
	Canals in Tatta, &c.	..	..	..	2,840	1,110	3,950	1,243	5,193	2,840	1,110	1,243	5,193
	Pinyári	8	3	11	71,662	27,793	98,855	7,641	1,06,526	71,100	27,796	7,641	1,06,537
	Canals in Mirpur Bathoro	..	..	..	3,943	1,541	5,484	1,472	6,956	3,943	1,541	1,472	6,956
	Canals in Sujáwal	..	..	..	1,582	612	2,194	870	3,064	1,582	612	870	3,064
	Satta	..	..	..	1,423	556	1,979	1,566	3,545	1,423	556	1,566	3,545
	Canals in Jati	..	..	..	1,007	394	1,401	303	1,704	1,007	394	303	1,704
	Khanta	..	..	..	2,261	884	3,145	915	4,060	2,261	884	915	4,060
	Kokowári	..	..	..	..	..	..	2,657	2,657	..	..	2,657	2,657
	Canals in Shábhandar	..	..	..	1,008	394	1,402	422	1,824	1,008	394	422	1,824
	Bunds, Left Bank	4,674	1,826	6,500	20,167	7,884	28,051	201	28,252	24,841	9,710	201	34,752
	Bunds, Right Bank	..	..	..	9,639	3,775	13,414	27	13,441	9,639	3,775	27	13,441
Begári Canals		84,443	12,181	96,624	1,12,810	25,275	1,38,085	26,081	1,64,166	1,97,253	37,456	26,081	2,60,790
Shikárpur Canals		12,401	2,795	15,196	92,035	20,854	1,13,789	22,558	1,36,347	1,05,336	23,649	22,558	1,51,543
Ghar Canals		17,643	3,287	20,930	1,96,093	36,650	2,32,143	94,841	3,26,984	2,13,736	39,337	94,841	3,47,914
Eastern Nára Canals		..	..	..	45,095	10,929	56,024	13,479	69,503	45,095	10,929	13,479	69,503
Hyderabad Canals		766	187	953	1,50,611	36,113	1,86,724	54,324	2,41,048	1,51,377	36,300	54,324	2,42,001
Fuleli Canals		186	54	240	1,30,229	37,607	1,67,836	17,599	1,85,435	1,30,415	37,661	17,599	1,85,675
Karáchi Canals		4,704	1,838	6,542	1,41,218	55,208	1,96,426	43,770	2,40,196	1,45,922	57,046	43,770	2,46,738
	Total	1,20,143	20,342	1,40,485	8,63,991	2,22,036	10,91,027	2,72,652	13,63,679	9,89,134	2,42,378	2,72,652	15,04,164

J. LEMESURIER, Colonel, R.E.,
Superintending Engineer for Irrigation in Sind.

TABLE V.

Cultivation, Canal Revenue and Expenditure of 1882-83, as contrasted with three previous years.

Executive Charges.		Average of 3 previous Years.			Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.	1882-83.			Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.	Length in Miles of	
		Cultivation.	Canal Revenue.	Maintenance and Revenue Collection.			Cultivation.	Canal Revenue.	Maintenance and Revenue. Collection.			Canals.	Bunds.
		Acres.	Rs.	Rs.			Acres.	Rs.	Rs.				
Begári Canals ..	Desert Canal	80,029	1,07,932	21,833	20·22	·27	93,784	1,34,566	21,350	15·86	·23	102	..
	Begári Canal	87,861	1,14,204	68,319	59·79	·78	1,39,907	2,23,200	87,006	39·00	·62	148	..
	Kashmor Bund	..	954	78,406	..	..	645	1,144	55,810	..	..	..	47
Shikárpur Canals.	Canals in Rokri	40,298	92,365	39,362	42·62	·98	52,124	1,10,254	45,109	40·90	·86	212	..
	Bukkis in Rohri	3,410	7,322	12,487	..	..	3,821	7,229	17,991	..	..	..	54
	Sind Canal	46,997	1,12,803	35,000	31·02	·75	51,760	1,16,143	36,361	30·43	·68	67	..
	Sukkur-Begári Bund ..	..	105	37,806	..	..	..	63	38,736	..	..	..	36
Ghár Canals ..	Sukkur Canal	69,408	1,02,394	50,636	49·50	·34	73,793	1,54,862	57,754	37·29	·78	127	..
	Ghár	212,789	4,95,801	1,04,473	21·07	·49	234,320	6,56,735	1,96,265	29·75	·83	233	..
	Nára	109,497	2,07,006	96,975	32·61	·88	130,893	3,44,632	99,711	28·32	·69	217	..
	Wáhur	7,405	23,691	4,811	18·20	·58	9,677	22,855	6,960	30·43	·72	23	..
	Márui	4,866	11,691	2,495	21·50	·57	3,698	10,227	2,333	22·79	·63	16	..
	Bunds, Right Bank ..	592	1,435	15,539	..	..	12	61	32,961	..	..	..	108
Eastern Nára Canals.	Nára Supply Channel ..	319	4,079	2,801	..	..	62	3,618	5,530	..	..	12	..
	Eastern Nára Canal ..	15,859	46,453	24,446	52·63	1·54	7,866	26,620	16,140	60·63	2·05	..	110
	Mithrau Canal	70,684	1,23,471	62,056	42·09	·74	56,993	93,291	30,396	32·59	·53	141	16
	Thar Canal	6,041	9,314	10,492	112·63	1·74	9,572	16,353	14,815	90·60	1·55	52	..
	Dimwáh	498	899	599	66·23	1·20	1,130	2,151	2,243	103·92	2·07	18	..
	Heranwáh	48	105	27	25·71	·56	136	249	277	111·24	2·04	3	..
Hyderabad Canals.	Mehrabwáh	9,721	23,904	5,921	24·81	·61	11,811	27,959	6,648	23·77	·56	59	..
	Naarat	11,398	40,123	24,499	61·06	2·15	23,257	59,906	44,056	73·54	1·89	66	..
	Naokákhi	39,297	98,262	43,245	44·01	1·10	42,504	1,10,496	47,792	43·25	1·12	137	..
	Dámbro	7,213	16,735	5,599	33·46	·78	6,117	16,304	5,522	34·80	·90	55	..
	Dád	24,277	47,825	11,089	23·14	·82	24,010	47,474	10,065	21·20	·42	105	..
	Eein	11,083	27,163	13,210	48·65	1·19	10,339	21,741	9,595	44·13	·93	134	..
	Alibahr Kacheri	3,647	17,275	5,893	34·11	·93	3,890	15,731	4,601	29·25	·62	56	..
	Márak	47,217	99,956	13,731	13·86	·29	46,664	93,915	16,937	18·03	·36	194	..
	Gharo Mahmúda	52,389	91,783	43,330	47·74	·82	52,297	84,582	38,674	46·00	·74	221	..
	Kari Shumáli	32,842	44,041	16,780	38·10	·51	35,336	40,901	12,290	30·33	·35	214	..
	Nasir	27,343	41,406	14,850	35·81	·54	27,170	41,150	18,967	46·08	·70	128	..
	Sarfráz	20,930	26,149	11,729	44·85	·56	21,044	26,066	11,536	44·25	·53	116	..
	Other Canals	29,729	43,129	12,526	29·58	·60	22,840	55,441	14,865	26·91	·63	112	..
Fuleli Canals ..	Fuleli	206,506	3,52,544	1,32,354	37·54	·64	191,449	3,31,738	1,62,322	48·86	·84	994	..
	Other Canals	18,053	34,129	31,478	92·26	1·74	19,785	32,767	28,113	70·55	1·17	153	8
Karáchi Canals	Nára	66,045	1,59,020	25,748	16·19	·39	75,137	1,52,728	23,093	15·12	·30	106	..
	Phita	7,837	16,492	3,951	21·37	·50	6,565	14,346	3,525	24·57	·54	27	..
	Canals north of Kotri ..	12,514	23,170	11,680	50·41	·93	15,075	29,479	8,133	27·59	·54	58	..
	Kalri	9,082	22,126	18,076	81·70	1·87	10,228	19,315	18,001	93·20	1·77	136	..
	Baghar	13,764	27,163	8,906	31·98	·62	17,256	31,098	6,887	22·15	·40	114	..
	Uchita	14,646	25,769	5,656	14·14	·34	12,315	29,643	3,185	10·74	·26	44	..
	Canals in Tatta, &c. ..	8,003	16,402	8,009	48·83	1·00	9,341	13,062	5,193	39·76	·56	96	..
	Pinyári	52,906	1,11,990	47,825	42·73	·90	56,079	80,435	1,06,526	132·36	1·90	389	..
	Canals in Mirpur Batoro ..	9,396	20,710	10,395	50·19	1·11	9,094	15,651	6,956	44·44	·74	99	..
	Canals in Sujáwal ..	6,140	12,486	2,984	23·90	·48	10,773	8,882	3,054	34·50	·28	51	..
	Satta	7,630	17,482	6,341	36·27	·83	8,724	16,745	3,545	21·17	·40	58	..
	Canals in Játi	2,156	4,230	2,493	58·96	1·15	1,826	3,263	1,701	54·08	·93	11	..
	Khanta	5,413	11,566	6,602	57·08	1·22	6,570	8,821	4,060	41·34	·62	59	..
	Kotowari	12,995	30,061	4,054	13·47	·29	15,138	26,224	2,657	10·13	·18	100	..
	Canals in Shahbandar ..	2,298	4,701	3,066	65·22	1·33	2,651	4,934	1,824	36·97	·69	32	..
	Bunds, Left Bank ..	1,184	2,153	19,027	..	..	843	1,550	28,452	..	..	..	55
	Bunds, Right Bank ..	664	256	13,555	..	..	546	271	13,441	..	..	..	28
Begári Canals		167,890	2,23,200	1,62,558	75·52	1·00	234,336	3,50,000	1,64,166	45·73	·70	250	47
Shikárpur Canals		90,705	2,12,655	1,24,704	58·64	1·37	107,714	2,33,709	1,86,347	58·34	1·27	279	90
Ghár Canals		395,007	9,81,978	2,74,379	29·44	·69	452,393	11,89,362	3,26,984	27·49	·72	695	108
Eastern Nára Canals		93,450	1,84,521	90,421	49·00	·97	75,759	1,42,282	69,503	48·85	·92	220	126
Hyderabad Canals		310,561	6,26,711	2,22,388	35·56	·72	333,086	6,41,675	2,41,048	37·56	·72	1,668	..
Fuleli Canals		224,559	3,86,664	1,63,832	42·37	·73	211,234	3,64,503	1,85,435	50·87	·88	1,147	8
Karáchi Canals		234,054	5,17,702	1,97,465	38·14	·84	258,771	4,57,497	2,40,196	52·50	·93	1,360	83
	Total ..	1,516,228	*30,83,431	12,42,197	40·29	·82	1, 73,293	33,83,028	13,63,679	40·23	·82	5,505	462

	Rs.
* Net Canal Revenue	30,83,431
Agricultural Receipts	1,323
Total ..	30,84,754

Agricultural Receipts ..	1,295
Total ..	33,89,313

J. LeMESURIER, Colonel, R.E.,
Superintending Engineer for Irrigation in Sind.

TABLE VI.

Direct and Indirect Receipts of Canal Revenue for 1882-83.

Executive Charges.		Water Share of net Consolidated Revenue as in Table VII.	Deduct Average before Improvements.	Balance Irrigation Share due to Canals.	Direct Receipts Hakaba and Miscellaneous.	Difference of Assessment on Jaghir Land.	Total Direct and Indirect Receipts.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	Desert Canal	1,18,901	.....	1,18,901	15,665	14,304	1,48,870
	Begári Canal	1,87,985	24,856	1,63,129	35,305	38,829	2,37,263
	Kashmor Bund	1,144	.....	1,144	.....	.....	1,144
Shikárpur Canals	Canals in Rohri	1,08,472	.....	1,08,472	1,782	1,872	1,12,126
	Bunds in Rohri...	7,224	.....	7,224	5	.....	7,229
	Sind Canal	1,15,266	.....	1,15,266	897	4,253	1,20,416
	Sukkur-Begári Bund .. .	.....	.....	.....	63	.....	63
Ghár Canals	Sukkur Canal	1,53,981	71,550	82,431	881	1,051	84,363
	Ghár	6,52,215	1,16,832	5,35,383	4,520	12,369	5,52,272
	Nára	3,38,273	.....	3,38,273	6,359	20,099	3,64,731
	Wáhur	22,337	.....	22,337	498	.....	22,835
	Márui	10,237	.....	10,237	.....	... ..	10,237
	Bunds, Right Bank	41	.....	41	20	.. ...	61
Eastern Nára Canals ...	Nára Supply Channel	138	.....	138	3,480	284	3,902
	Eastern Nára	10,630	3,444	7,186	15,990	.....	23,176
	Mithrau Canal	92,426	.....	92,426	865	.....	93,291
	Thar Canal	16,110	.....	16,110	243	711	17,064
	Dimwáh	2,151	.....	2,151	.....	.....	2,151
	Heranwáh	249	.....	249	.....	.....	249
Hyderabad Canals ...	Mehrabwah	27,942	.....	27,942	17	.....	27,959
	Nasrat	59,315	.....	59,315	591	1,563	61,469
	Naolakhi	1,09,302	.....	1,09,302	1,194	6,278	1,16,774
	Dámbro	16,073	.....	16,073	231	1,499	17,803
	Dád	44,929	.....	44,929	2,545	14,502	61,976
	Rein	21,603	.....	21,603	138	.. ...	21,741
	Alibahr Kacheri	15,264	8,427	6,837	467	1,995	9,299
	Márak	91,514	36,459	55,055	2,401	8,310	65,766
	Gháro Máhmuda	79,947	... ..	79,947	4,635	9,723	94,305
	Kari Shumáli	38,687	.....	38,687	2,214	3,241	44,142
	Nasir	40,347	.....	40,347	812	1,502	42,661
	Sarfráz	24,824	11,155	13,669	1,242	2,478	17,389
	Other Canals	54,258	.....	54,258	1,183	5,201	60,642
Fuleli Canals	Fuleli	3,12,269	1,67,604	1,44,665	19,467	69,716	2,43,848
	Other Canals	31,803	.....	31,803	964	8,877	31,644
Karáchi Canals	Nára	1,48,245	.....	1,48,245	4,483	5,301	1,58,029
	Phitta	13,730	.....	13,730	616	788	15,134
	Canals north of Kotri... ...	28,903	.....	28,903	576	1,845	31,324
	Kalri	19,054	... ..	19,054	261	1,207	20,522
	Baghár	30,516	.....	30,516	582	3,335	34,433
	Uchita	29,643	.....	29,643	.....	.....	29,643
	Canals in Tatta, &c.	12,515	.....	12,515	547	2,519	15,581
	Pinyári	77,812	.....	77,812	2,673	4,040	84,525
	Canals in Mirpur Batoro ...	15,651	.....	15,651	.....	.....	15,651
	Canals in Sujáwal	8,808	.....	8,808	74	85	8,967
	Satta	16,621	.....	16,621	124	684	17,429
	Canals in Játi	3,222	.....	3,222	41	257	3,520
	Khánta	9,761	.....	9,761	60	436	10,257
	Kokowári	26,120	.....	26,120	104	.....	26,224
	Canals in Sháhbandar... ...	4,482	.....	4,482	452	436	5,370
	Bunds, Left Bank	1,445	.....	1,445	105	915	2,465
	Bunds, Right Bank	132	.....	132	139	1,114	1,385
Begári Canals		3,08,030	24,856	2,83,174	50,970	53,133	3,87,277
Shikárpur Canals		2,30,962	.....	2,30,962	2,747	6,125	2,39,834
Ghár Canals		11,77,084	1,88,382	9,88,702	12,278	33,519	10,34,499
Eastern Nára Canals		1,21,704	3,444	1,18,260	20,578	995	1,39,833
Hyderabad Canals		6,24,005	56,041	5,67,964	17,670	56,292	6,41,926
Fuleli Canals		3,44,072	1,67,604	1,76,468	20,431	78,593	2,75,492
Karáchi Canals		4,46,660	.....	4,46,660	10,837	22,962	4,80,459
Total ...		32,52,517	4,40,327	28,12,190	1,35,511	2,51,619	31,99,320
Add—Agricultural Receipts ...					1,285	.....	1,285
Total ...					1,36,796	2,51,619	32,00,605

J. LeMESURIER, Colonel, R.E.,
Superintending Engineer for Irrigation in Sind.

TABLE VI. A.

Actual Direct and Indirect Receipts of Canal Revenue in 1882-83 as shown in the General Revenue Accounts of Divisions prepared by the Examiner, Public Works Accounts.

Executive Charges.		Water Share of net Consolidated Revenue collected.	Deduct Average before improvements.	Balance Irrigation Share due to Canals.	Direct Receipts Hakaba and Miscellaneous.	Difference of Assessment on Jághir Land.	Total Direct and Indirect Receipts.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	Desert Canal	96,068	.....	96,068	15,665	14,304	1,26,037
	Begári Canal	1,85,600	24,856	1,60,744	35,305	38,829	2,34,878
	Kashmor Bund	1,144	.....	1,144	.....	.....	1,144
Shikárpur Canals	Canals in Rohri	1,09,118	.....	1,09,118	1,782	1,872	1,12,772
	Bunds in Rohri	7,914	.....	7,914	5	.....	7,919
	Sind Canal	1,06,870	.....	1,06,870	897	4,253	1,12,020
	Sukkur-Begári Bund	.....	.....	.....	63	.....	63
Ghár Canals	Sukkur Canal	1,37,727	71,550	66,177	881	12,369	79,427
	Ghár	6,27,691	1,16,832	5,10,859	4,520	1,051	5,16,430
	Nára	3,29,721	.....	3,29,721	6,359	20,099	3,56,179
	Wáhur	22,416	.....	22,416	498	.....	22,914
	Márui	10,219	.....	10,219	.....	.....	10,219
	Bunds, Right Bank	39	.....	39	20	.....	59
Eastern Nára Canals	Nára Supply Channel	138	.....	138	3,480	284	3,902
	Eastern Nára	10,632	3,444	7,188	15,990	.....	23,178
	Mithrau Canal	92,547	.....	92,547	865	.....	93,412
	Thar Canal	16,360	.....	16,360	243	711	17,314
	Dimwáh	2,151	.....	2,151	.....	.....	2,151
	Meranwáh	249	.....	249	.....	.....	249
Hyderabad Canals	Mehrabwáh	25,975	.....	25,975	17	.....	25,992
	Nasrat	46,358	.....	46,358	591	1,563	48,512
	Naolakhi	98,602	.....	98,602	1,194	6,278	1,06,074
	Dámbro	14,866	.....	14,866	231	1,499	16,596
	Dád	40,802	.....	40,802	2,545	14,502	57,849
	Rein	20,546	.....	20,546	138	.....	20,684
	Alibahr Kacheri	15,550	8,427	7,123	467	1,995	9,585
	Márak	97,241	36,459	60,782	2,401	8,310	71,493
	Gháro Máhmuda	81,123	.....	81,123	4,635	9,723	95,481
	Kari Shumáli	38,252	.....	38,252	2,214	3,241	43,707
	Nasir	41,360	.....	41,360	812	1,502	43,674
	Sarfráz	24,110	11,155	12,955	1,242	2,478	16,675
	Other Canals	40,087	.....	40,087	1,183	5,201	46,471
Fuleli Canals	Fuleli	3,06,858	1,67,604	1,39,254	19,467	69,716	2,28,437
	Other Canals	21,424	.....	21,424	964	8,877	31,265
Karáchi Canals	Nára	1,44,547	.....	1,44,547	4,483	5,301	1,54,331
	Phitta	12,237	.....	12,237	616	788	13,641
	Canals north of Kotri	28,740	.....	28,740	576	1,845	31,161
	Kalri	17,977	.....	17,977	261	1,207	19,445
	Baghár	29,560	.....	29,560	582	3,335	33,477
	Uchita	24,025	.....	24,025	.....	.....	24,025
	Canals in Tatta, &c.	11,882	.....	11,882	547	2,519	14,948
	Pinyári	73,798	.....	73,798	2,673	4,040	80,511
	Canals in Mirpur Batoro	14,715	.....	14,715	.....	.....	14,715
	Canals in Sujáwal	8,625	.....	8,625	74	85	8,784
	Satta	15,538	.....	15,538	124	684	16,346
	Canals in Játi	3,883	.....	3,883	41	257	4,181
	Khánta	9,084	.....	9,084	60	436	9,580
	Kokowári	26,459	.....	26,459	104	.....	26,563
	Canals in Sháhbandar	3,765	.....	3,765	452	436	4,653
	Bunds, Left Bank	1,899	.....	1,899	105	915	2,919
	Bunds, Right Bank	132	.....	132	139	1,114	1,385
Begári Canals		2,82,812	24,856	2,57,956	50,970	53,133	3,62,059
Shikárpur Canals		2,23,902	.....	2,23,902	2,747	6,125	2,32,774
Ghár Canals		11,27,813	1,88,382	9,39,431	12,278	33,519	9,85,228
Eastern Nára Canals		1,22,077	3,444	1,18,633	20,578	995	1,40,206
Hyderabad Canals		5,84,872	56,041	5,28,831	17,670	56,292	6,02,793
Fuleli Canals		3,28,282	1,67,604	1,60,678	20,431	78,593	2,59,702
Karáchi Canals		4,26,866	.....	4,26,866	10,837	22,962	4,60,665
	Total	30,96,624	4,40,327	26,56,297	1,35,511	2,51,619	30,43,427
	Add—Agricultural Receipts				1,285	.....	1,285
					1,36,796	2,51,619	30,44,712

J. LeMESURIER, Colonel, R.E.,
Superintending Engineer for Irrigation in Sind.

TABLE VII.

Area of Cultivation and Consolidated Revenue for 1882-83.

Executive Charges.		Cultivation.			Consolidated Revenue.			Remissions.			Net Consolidated Revenue.	Land Share 10 per cent.	Water Share 90 per cent.
		Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.			
		Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	Desert Canal	67,933	3,936	71,869	1,24,249	7,863	1,32,112	..	..	..	1,32,112	13,211	1,18,901
	Begári Canal	97,556	5,976	103,532	1,99,789	9,083	2,08,872	..	..	..	2,08,872	20,887	1,87,985
	Kashmor Bund	33	612	645	65	1,206	1,271	..	..	..	1,271	127	1,144
Shikárpur Canals	Canals in Rohri	37,210	14,138	51,348	89,809	30,966	1,20,775	250	..	250	1,20,525	12,053	1,08,472
	Bunds in Rohri	3,222	599	3,821	7,807	159	8,026	..	..	..	8,026	802	7,224
	Sind Canal	42,158	7,799	49,957	1,18,911	9,755	1,28,666	592	..	592	1,28,074	12,808	1,15,266
	Sukkur-Begári Bund	....	..	....	..	..	....	..	..	..	..	..	..
Ghár Canals	Sukkur Canal	56,024	17,259	73,283	1,43,236	29,936	1,73,172	1,711	371	2,082	*1,71,090	17,109	1,53,981
	Ghár	2,07,700	22,565	230,265	6,79,878	72,794	7,52,672	27,578	411	27,989	7,24,683	72,468	6,52,215
	Nára	91,636	31,173	122,809	2,93,095	1,18,428	4,11,523	34,146	1,518	35,664	3,75,859	37,586	3,38,273
	Wáhur	8,137	1,540	9,677	21,100	4,725	25,825	1,006	..	1,006	24,819	2,482	22,337
	Márui	2,439	1,259	3,678	6,318	5,133	11,451	38	39	77	11,374	1,137	10,237
	Bunds, Right Bank	12	..	12	46	..	46	..	..	..	46	5	41
Eastern Nára Canals	Nára Supply Channel	31	31	62	76	77	153	..	..	..	153	15	138
	Eastern Nára	1,198	6,668	7,866	1,902	11,334	13,236	1,391	311	1,425	11,811	1,181	10,630
	Mithrau Canal	49,825	7,168	56,993	1,02,552	11,718	1,14,270	11,458	116	11,574	1,02,696	10,270	92,426
	Thar Canal	7,286	1,864	9,150	15,661	2,716	18,377	159	318	477	17,900	1,790	16,110
	Dimwáh	919	211	1,130	1,835	555	2,390	..	..	..	2,390	239	2,151
	Heranwáh	130	6	136	263	14	277	..	..	..	277	28	249
Hyderabad Canals	Mehrabwáh	8,966	2,678	11,644	23,345	10,585	33,930	2,883	..	2,883	31,047	3,105	27,942
	Nasrat	15,925	6,726	22,651	50,934	28,707	79,641	13,615	121	13,736	65,905	6,590	59,315
	Naolakhi	34,132	6,039	40,171	1,08,156	15,018	1,23,174	1,660	67	1,727	1,21,447	12,145	1,09,302
	Dámbro	4,850	777	5,627	15,948	1,911	17,859	..	..	..	17,859	1,786	16,073
	Dád	16,545	2,700	19,245	41,835	8,465	50,300	375	4	379	49,921	4,992	44,929
	Rein	9,486	853	10,339	21,929	2,074	24,003	..	..	..	24,003	2,400	21,603
	Alibahr Kacheri	7,830	5	7,835	16,766	194	16,960	..	..	..	16,960	1,696	15,264
	Márak	40,971	113	41,084	1,01,352	330	1,01,682	..	..	..	1,01,682	10,168	91,514
	Gháro Mahmuda	37,974	3,707	41,681	84,355	4,489	88,844	14	..	14	88,830	8,883	79,947
	Kari Shumáli	27,450	492	27,942	42,315	671	42,986	..	..	..	42,986	4,299	38,687
	Nasir	23,659	1,362	25,021	43,273	1,557	44,830	..	..	..	44,830	4,483	40,347
	Sarfráz	17,079	625	17,704	27,197	385	27,582	..	..	..	27,582	2,758	24,824
	Other Canals	17,268	3,938	21,206	48,942	11,423	60,365	78	..	78	60,287	6,029	54,258
Fuleli Canals	Fuleli	144,413	10,863	155,281	1,41,200	10,998	3,52,198	5,101	132	5,233	3,46,965	34,696	3,12,269
	Other Canals	15,754	1,067	16,821	34,291	1,061	35,352	15	..	15	35,337	3,534	31,803
Karáchi Canals	Nára	36,083	36,270	72,353	94,206	92,565	1,86,771	20,172	1,882	22,054	1,64,717	16,472	1,48,245
	Phitta	4,335	1,577	5,912	12,643	4,505	17,148	1,601	291	1,892	15,256	1,526	13,730
	Canals north of Kotri	10,075	3,802	13,877	22,759	10,190	32,949	619	216	835	32,114	3,211	28,903
	Kalri	7,913	1,815	9,728	24,288	6,165	30,453	8,426	856	9,282	21,171	2,117	19,054
	Baghár	12,222	3,749	15,971	29,121	8,295	37,416	2,670	839	3,509	33,907	3,391	30,516
	Uchita	11,729	586	12,315	35,531	1,521	37,052	4,116	..	4,116	32,936	3,293	29,643
	Canals in Tatta, &c.	6,911	1,323	8,234	17,882	3,702	21,584	7,345	334	7,679	13,905	1,390	12,515
	Pinyári	49,534	4,734	54,268	1,14,028	13,259	1,27,287	39,397	1,432	40,829	86,458	8,646	77,812
	Canals in Mirpur Batoro	8,576	1,118	9,694	19,887	1,364	21,251	3,837	24	3,861	17,390	1,739	15,651
	Canals in Sujáwal	6,015	4,723	10,738	11,739	1,837	13,576	3,711	78	3,789	9,787	979	8,808
	Satta	7,699	726	8,425	18,994	1,507	20,501	1,973	60	2,033	18,468	1,847	16,621
	Canals in Játi	1,452	273	1,725	3,650	350	4,000	410	10	420	3,580	358	3,222
	Khanta	6,216	177	6,393	11,742	789	12,531	1,617	68	1,685	10,846	1,085	9,761
	Kokowári	14,475	663	15,138	31,097	1,832	32,929	3,847	60	3,907	29,022	2,902	26,120
	Canals in Shahbandar	2,258	213	2,471	4,498	977	5,475	431	64	495	4,980	498	4,482
	Bunds, Left Bank	442	16	458	1,612	112	1,724	119	..	119	1,605	160	1,445
	Bunds, Right Bank	....	87	87	..	147	147	..	..	..	147	15	132
Begári Canals		165,522	10,524	176,046	3,24,103	18,152	3,42,255	..	..	..	3,42,255	34,225	3,08,030
Shikárpur Canals		82,590	22,536	105,126	2,16,587	40,880	2,57,467	842	..	842	2,56,625	25,663	2,30,962
Ghár Canals		365,948	73,796	439,744	11,43,723	2,30,966	13,74,689	64,479	2,339	66,818	13,07,871	1,30,787	11,77,084
Eastern Nára Canals		59,389	15,948	75,337	1,22,289	26,414	1,48,703	18,008	468	13,476	1,35,227	13,523	1,21,704
Hyderabad Canals		262,135	30,015	292,150	6,26,347	35,809	7,12,156	18,625	192	18,817	6,93,339	69,334	6,24,005
Fuleli Canals		160,172	11,930	172,102	3,75,491	12,059	3,87,550	5,116	132	5,248	3,82,302	38,230	3,44,072
Karáchi Canals		185,935	61,852	247,787	4,53,677	1,49,117	6,02,794	1,00,291	6,214	1,06,505	4,96,289	49,629	4,46,660
	Total	1,281,691	226,601	1,508,292	32,62,217	5,63,397	38,25,614	2,02,861	9,345	2,11,706	36,13,908	3,61,391	32,52,517

TABLE VIII.

Discharges of certain Canals, Areas of Crops of different kinds irrigated, and Duty of Water per cubic foot of supply for Kharif Season 1882.

Executive Charges and Canals.			Average Discharge.	Areas of Crops irrigated.				Area of Land irrigated.		Total Area irrigated.	Area irrigated per Cubic foot of Supply.
				Jowári.	Bájri.	Rice.	Other Crops.	By Lift.	By Flow.		
			Cubic feet per second.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
Upper Sind Frontier	Begári Canals	Desert Canal	1,305	63,235	7,688	181	*10,036	10,807	70,333	81,140	62·17
		Muradwáh	312	5,616	2,214	100	†2,878	799	10,009	10,808	34·64
		Begári Canal	3,791	96,665	1,850	5,794	‡43,891	..	..	1,48,200	39·09
Shikárpur Collectorate	Shikárpur Canals	Sind Canal	1,008	18,613	87	19,260	4,198	7,638	34,520	42,158	41·80
Thar and Párkar	Eastern Nára Canals	Mithrau Canal	830	98	9,878	32,945	7,095	15,418	34,598	50,016	58·16
Hyderabad Collectorate	Hyderabad Canals	Márak	1,395	4,205	30,953	31	11,961	46,256	894	47,150	34·80
		Ghalu	1,033	1,116	25,585	..	7,966	34,538	129	34,667	32·00
		Sarfráz	482	559	16,315	10	3,986	20,649	221	20,870	43·25
	Fuleli Canals	Fuleli	6,366	1,284	41,543	92,504	17,144	57,224	95,251	152,475	24·00
		Janamwáh Janobi	228	39	3,612	2,548	1,202	4,773	2,628	7,401	32·46
		Sanhi Guni	541	15	31	4,448	73	45	4,522	4,567	8·44
		Sherwáh	146	..	25	833	38	51	895	946	6·48
		Aliwáh	182	4	6	1,683	15	10	1,698	1,708	9·38

* Includes 6,158 acres of rabi flooded during the kharif.
† Do. 2,614 do. do.
‡ Do. 6,933 do. do.

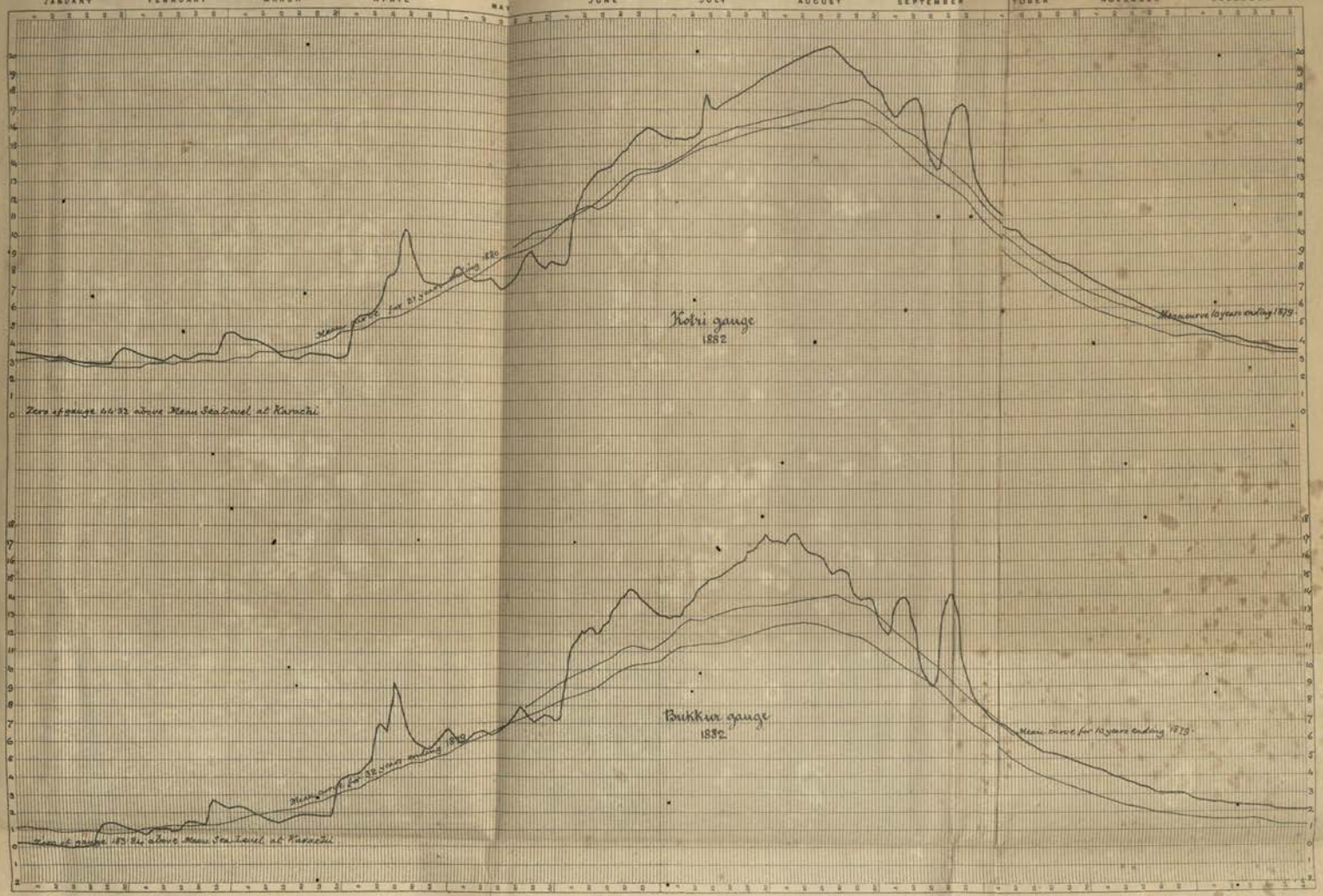
J. LeMESURIER, Colonel, R.E.,
Superintending Engineer for Irrigation.

TABLE IX.

Rainfall in the Province of Sind for 1882-83.

Collectorates, and Tálukas.		April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Total
		In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Shikárpur Collectorate. — Begári Canals.	Kashmor	...	...	...	4·19	1·04	...	...	...	...	0·02	...	0·05	5·30
	Thul	...	...	...	2·48	1·82	...	...	...	...	0·04	...	0·08	4·42
	Jacobabad	...	...	...	0·73	1·38	...	...	...	...	0·63	...	0·04	2·78
Shikárpur Canals.	Ubáuro	...	...	...	8·92	1·02	...	...	...	...	0·28	...	0·10	10·32
	Mirpur	...	...	...	5·30	1·57	...	...	...	...	0·62	0·09	...	7·58
	Ghotki	...	...	...	2·83	2·63	...	...	...	...	0·67	...	0·01	6·14
	Rohri	...	...	...	2·96	0·40	...	...	...	...	0·14	...	0·05	3·55
	Shikárpur	...	...	...	3·70	0·54	0·45	...	...	...	0·12	...	0·07	4·88
	Sukkur	...	...	..	3·82	0·59	...	...	...	...	0·07	...	...	4·48
	Naushahro Abro	...	...	...	2·10	1·48	...	...	...	...	0·11	...	...	3·69
		...	...	...	1·96	0·01	...	...	...	...	0·19	...	...	2·16
Ghár Canals.	Rato-dero	...												
	Sujáwal	...	...	...	2·61	1·62	...	...	...	...	0·07	...	0·12	4·42
	Lárkhána	...	..	...	1·58	0·63	...	...	...	...	0·30	...	...	2·51
	Kambar	...	...	...	1·12	0·07	...	...	...	...	0·03	...	...	1·22
	Bakrani	...	...	...	2·60	0·50	...	...	...	...	...	...	...	3·10
	Nasirabad	...	0·14	...	...	...	...	...	...	...	...	...	...	0·14
	Mehar	...	0·07	...	4·82	3·37	...	...	...	...	0·02	...	...	8·28
	Tharari	...	...	...	7·34	3·02	...	...	...	...	...	...	...	10·36
	Khairpur	...	...	...	3·23	2·40	0·10	...	...	...	...	...	...	5·73
	Warah	...	...	...	3·59	0·21	...	...	...	...	...	...	...	3·80
Thar & Párkar. — Eastern Nára Canals.	Khipra	...	...	...	6·63	3·08	...	..	...	...	0·57	...	...	10·28
	Umarkot	...	...	0·14	12·21	5·06	...	...	...	...	0·64	...	...	18·05
	Mitti	...	...	0·90	5·69	1·93	...	...	...	...	0·10	...	...	8·62
	Nagar	...	...	2·06	11·21	5·20	0·70	...	..	...	...	...	...	19·17
Hyderabad Collectorate. — Hyderábád Canals.	Kandiáro	...	...	...	5·90	2·83	...	...	...	...	...	...	...	8·73
	Naushahro	...	...	...	5·16	1·11	...	...	...	...	...	...	...	6·27
	Tháru Sháh	...	...	...	7·11	0·72	...	...	...	...	...	...	...	7·83
	Moro	...	0·10	0·19	...	4·78	2·61	...	...	...	...	...	...	7·68
	Sákrand	...	...	...	...	6·50	2·68	...	...	...	0·21	...	...	9·39
	Hála	...	...	0·05	...	8·91	1·92	...	...	...	0·15	...	...	11·03
	Shahdádpur	...	...	...	...	5·91	2·73	...	...	...	0·25	...	...	8·89
	Tando Adam	...	...	...	...	12·15	1·93	...	...	...	...	...	...	14·08
	Tando Alahyar	..	0·10	...	...	8·92	0·53	...	...	...	0·12	...	...	9·67
	Mirpur Khás	...	..	...	...	5·61	2·18	...	...	...	0·78	0·09	...	8·66
Fuleli Canals.	Hyderabad	...	0·23	...	...	12·15	1·84	...	...	...	0·92	...	...	15·14
	Tando Muhammad Khán	...	...	...	...	12·22	0·50	...	...	..	...	...	...	12·72
	Dero Mohbat	...	...	...	...	6·18	5·04	...	...	...	0·50	...	...	11·72
	Tando Bago	...	...	...	1·10	8·09	3·15	...	...	...	0·10	...	...	12·44
	Badin	...	...	...	...	8·94	1·88	...	...	...	0·30	...	...	11·12
	Guni	...	...	...	...	...	...	...	..	...	0·46	...	...	0·46
Karáchi Collectorate. — Karáchi Canals.	Dádú	...	0·72	...	3·54	1·32	...	...	...	...	0·02	...	...	5·60
	Johi	0·30	0·30	...	5·05	3·70	...	...	...	...	0·02	...	0·02	9·39
	Sehwan	0·10	0·12	...	4·26	0·54	...	...	...	...	0·07	...	...	5·09
	Mánjhand	...	...	...	10·87	2·42	...	...	...	...	0·07	...	...	13·36
	Kotri	...	0·08	...	13·80	1·75	...	...	...	...	0·10	...	0·22	15·95
	Bula Khán	...	...	...	12·88	2·12	...	...	...	...	0·25	...	0·09	15·34
	Jerruck	0·03	...	...	12·00	1·89	...	...	...	...	0·06	...	0·36	14·34
	Tatta	...	...	...	8·80	1·79	...	...	...	0·05	0·16	...	0·03	10·83
	Sákro	...	...	...	6·02	0·93	...	...	...	0·17	0·14	...	0·07	7·33
	Belo	...	...	...	8·27	4·53	...	...	...	...	...	...	...	12·80
	Mirpur Batoro	0·02	...	..	10·00	3·05	...	...	...	...	...	...	...	13·07
	Sujáwal	...	...	...	...	...	...	...	...	...	0·10	...	0·09	0·19
	Sháhbandar	...	...	...	6·45	1·54	...	...	...	...	0·56	...	0·21	8·76
	Kotri Ghorabari	...	...	...	5·30	1·71	...	..	...	...	0·21	...	0·06	7·28
	Keti Bandar	...	...	...	4·65	2·23	...	...	...	...	0·62	...	0·06	7·56
	Moghul Bhin	...	...	...	4·57	3·19	...	...	...	...	0·30	...	1·05	9·11
	Karáchi	...	...	...	7·87	1·21	...	...	...	...	0·35	...	0·15	9·58

J. LEMESURIER, Colonel, R.E.,
Superintending Engineer for Irrigation in Sind.



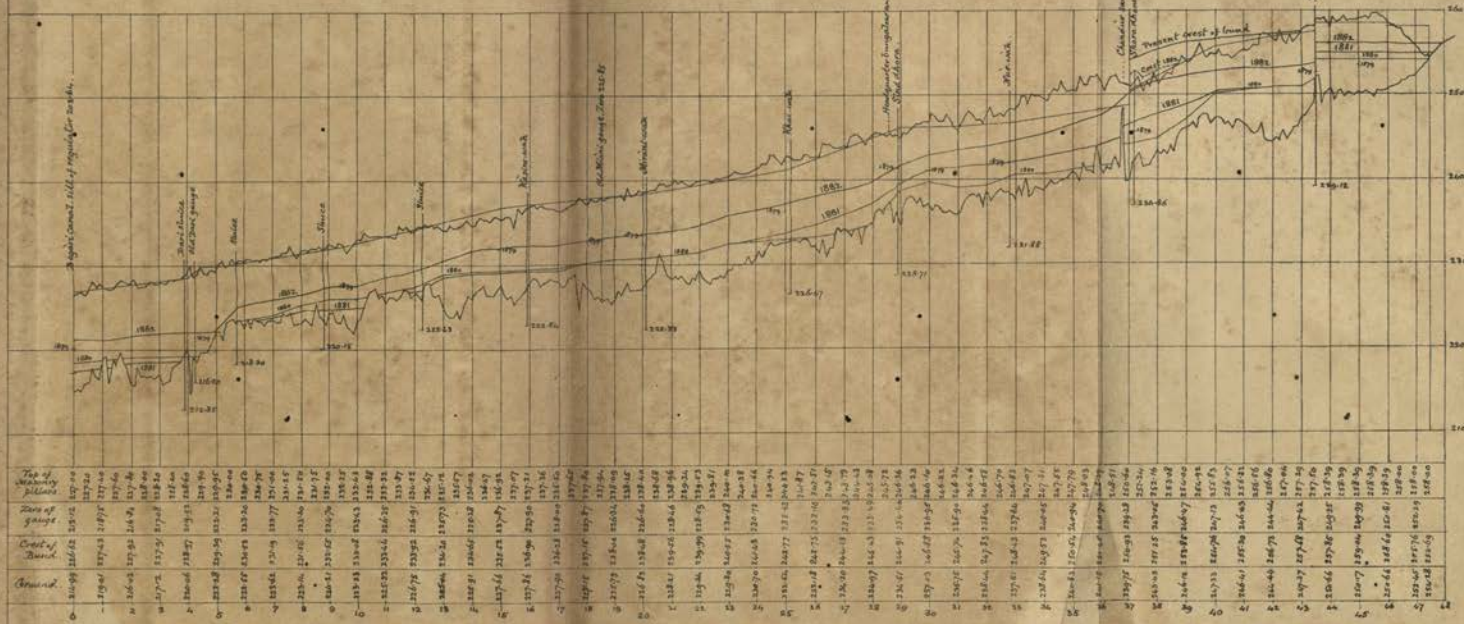
Govt. Photozinco: Office, Poona, 1884.

Sectional Paper to register the rise and fall of rivers &c. Supplied by the Geographical Branch of the Public Works Department, India Office, London. 1880

D. le Messurier
Col. R.E.
Supt. Sukkur Irrigation

Camp. Schwan
15-11-83

Longitudinal Section of the KASHMOR-BUND

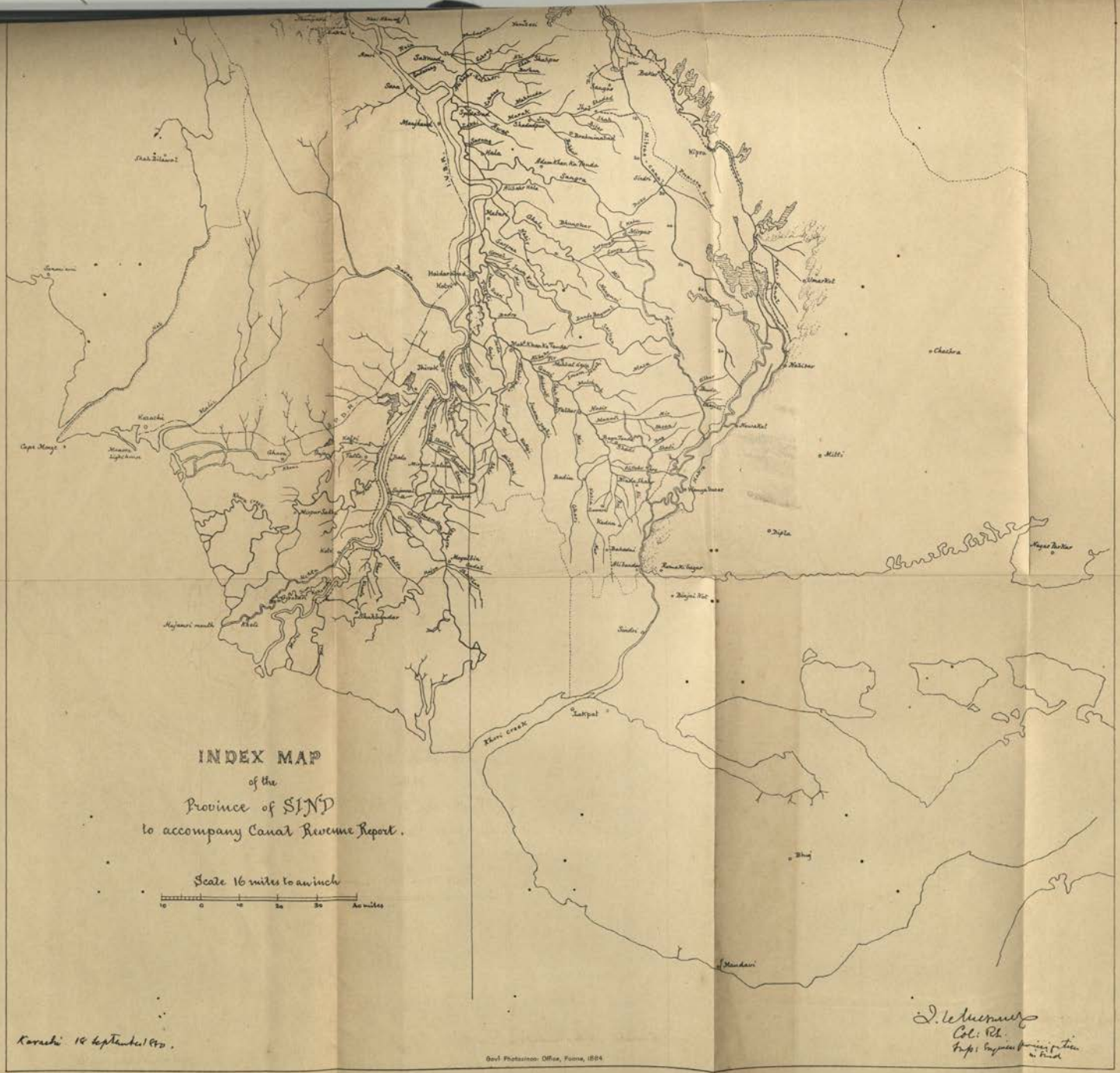

Present crest of bund
Present canal
Top of masonry pillars
Tops of gauges
Crest of Bund
Ground.
Horizontal scale 3 miles to an inch. — Vertical scale 10 feet to an inch.

Photozincographed from a Photograph
Govt Photozincog Office, Poona, 1884

D. Cumming
Col. RE
Supt. Engineering operations in Sind.

Karachi, 9 November 1883.

Camp Schwan 15.11.83.


INDEX MAP
of the
Province of SIND
to accompany Canal Revenue Report.
Scale 16 miles to an inch
10 0 10 20 30 40 miles
Karachi 10 September 1879.
D. Letchmere
Col: R.E.
Supt: Engineer Irrigation in Sind
Govt Photozinco: Office, Poona, 1884

No. 93 of 1884

PUBLIC WORKS DEPARTMENT.

FROM

THE SUPERINTENDING ENGINEER FOR IRRIGATION IN SIND;

TO

THE SECRETARY TO GOVERNMENT,
PUBLIC WORKS DEPARTMENT (IRRIGATION),
Bombay,

Camp Dari, 12th January 1884.

SIR,

I have the honour to forward my Irrigation Revenue Report for the year 1882-83, with the usual tables, charts, and index map of Sind.

2. I have made several alterations and additions to the index map, and have marked the Muradwáh, a branch of the Desert Canal, several canals which have been taken over by Government in the Shikárpur Collectorate, the new mouth to the Mehrabwáh, and several canals in the Sháhbandar districts which were omitted by mistake.

3. The report is, I regret to say, about two months behind time, but I only received the correct canal returns for Hyderabad and Karáchi during the Christmas holidays, and the manuscript of my report was finished on the 10th instant. As orders have recently been issued by Government regarding the submission of the canal returns by Collectors, it is possible that there may not be so much delay in future years: but it is quite impossible that the report can reach the Government of India by the 15th November.

4. Attached to the report is the general abstract of financial results prepared by the Examiner, Public Works Accounts.

I have the honour to be,
Sir,
Your most obedient Servant,
J. LEMESURIER, Colonel, R.E.,
Superintending Engineer for Irrigation in Sind.

Forwarded through the Commissioner in Sind.

PUBLIC WORKS DEPARTMENT.

Commissioner's Office, Camp Garhi Yasin, 28th January 1884.

Submitted to Government.

2. The inundation of 1882 was, the Superintending Engineer states, the highest on record, and throughout the inundation season the river was higher than usual. The Kashmor bund fortunately stood this severe trial though at times the cause of much anxiety, but the continuation of this bund from the Begári to Sukkur was breached and caused serious flooding over a large area, besides sweeping away a considerable length of the Indus Valley State Railway. South of Lárkhána also floods swept across a part of the Shikárpur district and here also considerable damage was occasioned. In Lower Sind too breaches in the protective embankments were numerous and very serious losses were suffered by the cultivators. In the Shikárpur Collectorate the flood waters permitted of extensive rabi cultivation which recouped many cultivators and also Government for the losses to kharíf crops; but in Lower Sind the same

compensation was not possible and the cultivators undoubtedly lost heavily, although remissions were granted. In spite of these disasters the year must be considered a favourable one on the whole as is apparent from the table in the Superintending Engineer's third paragraph. In this table, however, there is an error; the irrigation share of the assessment for 1881-82 should have been shown as Rs. 33,40,233, not Rs. 33,57,557, as this latter sum includes Rs. 17,324 on account of village cess which should not have been included; but even if this deduction is made, the revenue for that year is still in excess of that for 1882-83. The revenue for 1881-82 as shown is, however, misleading owing to the inclusion in the sum entered, of the assessment on a large area of fallow lands which was afterwards remitted; and had the system of excluding these lands from the revenue settlement which is now followed been in force last year, the revenue for 1882-83 would have been in excess of that for 1881-82. The Superintending Engineer correctly refers to this change in the method of treating fallows as explaining a decrease in the revenue from the Hyderabad district, but he does not seem to have known that the same cause explains the decrease in the Karáchi District also.

3. The table in para. 4 of the report shows clearly the increase or decrease in each division and shows that the largest increase occurred in the Ghár Canals. This is attributed to the introduction of the revision settlement; but although a considerable part is due to this cause, an important share is also to be attributed to the Ghár having provided a really good supply of water during the year. It is hardly correct to lay it down (as has been done in this paragraph) that "an increased rate of Re. 1 per acre has been imposed on all rice grown on land assessed "for dry-crops": the rice rate on such lands varies according to circumstances and depends on the settlement rates on rice lands of the same description as those on which rice is grown though not assessed for it; in many cases the rate is less than that stated. All lands on which rice is regularly grown have, however, in the revision settlement been assessed as rice lands and thus for the first time, as pointed out by Colonel LeMesurier, have contributed revenue in proportion to the supply of water they have consumed, and this undoubtedly is one of the main causes of the large increase in assessment in this District.

4. The remissions granted during the year were large as was to be expected with such heavy floods. The total (Rs. 2,11,706) shown in para. 5 does not correctly represent the remissions it was necessary to grant in consequence of floods, as some claims owing to pressure of work were not disposed of by Collectors till after the close of the revenue year. The Superintending Engineer has referred to a sum of Rs. 12,685 so granted, but other claims in the Shikárpur District amounting to Rs. 33,187 have not been mentioned. These together make the remissions granted just after the close of the year Rs. 45,872 and the actual remissions out of the year's revenue Rs. 2,57,578.

5. The Superintending Engineer has stated the condition of each of the principal canals so clearly that it seems unnecessary for the Commissioner to add anything regarding them. He may mention, however, that the increase in cultivation referred to in para. 19 is a sign of the success of the Kashmor bund and of the improvements of late years to canals. The increase, the Commissioner is glad to state, is even more marked this season, and he believes it will continue for some years until the lands devastated by the floods from Kashmor, now fortunately shut out, have again been brought under cultivation. The maintenance of the Kashmor bund is of such immense importance that its security should, if possible, be assured. The effects of its giving way are too serious to contemplate without alarm and, therefore, as the Superintending Engineer states in para. 23 that "at one time fears were entertained that it would not stand," the conclusion naturally is that even yet the bund is not quite what it should be and that it should be further raised. Whatever the cause, it is beyond question that of late years the river has been subject to higher freshes than formerly, and it cannot be a wise course to trust to no higher flood than that of last year coming down in future. The continuation of the Kashmor bund to the south of the Sukkur-Begári bund is evidently still far from being in an effective condition. There were 86 leaks, 3 of which became breaches, which were the cause of serious losses to the people as well as to Government. It is to be hoped that this bund will be strengthened before next inundation.

6. The Commissioner would also draw particular attention to the remarks regarding the Sukkur Canal. This canal, as shown in para. 28, was much improved during the year, and the results are becoming apparent along the whole line of the canal. The Commissioner has recently been along several parts of this canal and was glad to see that even now, at the end of January 1884, a good supply is flowing up to the tail of this canal. If this supply can only be maintained in future years, and timely notice is given to the cultivators, the area of rabi cultivation will be largely extended. A good supply of water for rabi cultivation would be an incalculable blessing to the cultivators of the district, and it is to be hoped that every endeavour will be made to improve it.

7. Colonel LeMesurier in para. 31 draws attention to the manner in which rabi cultivation has hitherto been treated in the Canal and Revenue Accounts; this some time ago attracted the attention of the Commissioner who altered it from the present year 1883-84, and in future when lands classed as kharíf are cultivated as rabi, both the area under such cultivation and the assessment thereon will appear under the head of Rabi, so that the inconvenience complained of by the Superintending Engineer has ceased to exist.

8. The particulars given regarding the different canals show that they worked well on the whole. The history of the year includes details of many floods, and this it need scarcely be said means much trying work to officers of the Irrigation Department at the most trying season of the year, and involved much exposure in intense heat—heat such as is hardly known in other parts of India, and much credit is due to the officers of the Irrigation Establishment for their exertions.

9. In the latter part of the 51st and in the following paragraphs the effects of the floods in Lower Sind are referred to and the large loss of revenue in consequence of the floods is detailed. The Commissioner has on several occasions urged on Government the necessity of more completely embanking this part of Sind and some funds have now been granted for the purpose, so that he trusts that such losses as are described in the present report may never again be experienced. Colonel LeMesurier attributes too much of the loss to the old system of leases, for, as the Commissioner satisfied himself last year when in the Sháhbandar District, a very large part of the leased lands are now under the Bigoti system, the old holders of leases having at their own request been allowed to relinquish them, as owing to constant floods and damage to canals they preferred to pay on their cultivation only. There is very little rabi cultivation in these districts as they are not well suited for this class of cultivation. Wheat is blighted by the heavy fogs that prevail for months in the spring, and even barley rarely flourishes really well. The losses have been due to actual damage from floods, and in but a very slight degree to the old leases. Temporary settlements have already been introduced into some of the tálukas in this division and will be general in a year or two. This change makes it all the more necessary to maintain the canals and embankments in good order.

H. N. B. ERSKINE,
Commissioner in Sind.

General Abstract of Financial Results of Irrigation

	WORKS IN								
	PRODUCTIVE PUBLIC WORKS.				IRRIGATION AND NAVIGATION ORDINARY WORKS FOR WHICH CAPITAL AND				
	Desert Canal.	Begári Canal.	Eastern Nára Works.	Total.	Sukkur Canal.	Ghár Canal.	Alibhar Kacheri Canal.	Márak Great Canal.	Sarfráz Canal.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Capital Outlay.									
During year ... Direct ...	1,40,444	95,854	1,97,665	4,33,963	41,822	.....	...	...	...
During year ... Indirect ...	2,115	1,562	4,593	8,270	976	1,992	...	63	...
Total ...	1,42,559	97,416	2,02,258	4,42,233	42,798	1,992	...	63	...
To end of year ... Direct ...	9,42,069	13,83,230	37,76,008	61,01,307	12,79,974	4,15,537	23,207	1,93,600	1,18,559
To end of year ... Indirect ...	34,532	42,601	1,54,237	2,31,370	55,901	25,440	710	7,548	6,121
Total ...	9,76,601	14,25,831	39,30,245	63,32,677	13,35,875	4,40,977	23,917	2,01,148	1,24,680
Gross Revenue.									
During year ... Direct ...	15,665	35,305	20,578	71,548	881	4,520	467	2,401	1,242
During year ... Indirect ...	96,068	1,60,744	1,18,633	3,75,445	66,177	5,10,859	7,123	60,782	12,955
Total ...	1,11,733	1,96,049	1,39,211	4,46,993	67,058	5,15,379	7,590	63,183	14,197
To end of year ... Direct ...	28,159	72,834	4,52,889	5,53,882	7,174	1,56,854	8,314	35,266	20,766
To end of year ... Indirect ...	8,68,684	24,10,622	31,80,726	64,60,032	4,07,827	88,07,381	60,819	4,36,269	91,348
Total ...	8,96,843	24,83,456	36,33,615	70,13,914	4,15,001	89,64,235	69,133	4,71,535	1,12,114
Working Expenses.									
During year ... Direct ...	21,350	87,006	69,503	1,77,859	57,754	1,44,042	4,601	16,937	11,536
During year ... Indirect ...	387	2,139	1,474	4,000	1,051	2,006	96	260	254
Total ...	21,737	89,145	70,977	1,81,859	58,805	1,46,048	4,697	17,197	11,790
To end of year ... Direct ...	2,28,826	14,02,655	19,00,138	35,31,619	6,11,669	22,67,110	59,836	1,59,543	1,14,261
To end of year ... Indirect ...	7,184	39,407	90,354	1,36,945	20,335	54,532	1,966	4,600	4,961
Total ...	2,36,010	14,42,062	19,90,492	36,68,564	6,32,004	23,21,642	61,802	1,64,143	1,19,222
Net Revenue.									
During year	89,996	1,06,904	68,234	2,65,134	8,253	3,69,331	2,893	45,986	2,407
To end of year	6,60,833	10,41,394	16,43,123	33,45,350	−2,17,003	66,42,593	7,331	3,07,392	−7,108
Simple Interest.									
During year	34,874	53,412	1,47,087	2,35,373	49,597	16,621	928	7,744	4,742
To end of year	2,71,499	7,12,640	26,66,829	36,50,968	7,39,768	2,94,991	9,802	73,423	53,101
Net Profit after paying off Interest.									
During year	55,122	53,492	−78,853	29,761	−41,344	3,52,710	1,965	38,242	−2,335
To end of year	3,89,334	3,28,754	−10,23,706	−3,05,618	−9,56,771	63,47,602	−2,471	2,33,969	−60,209

N.B.—Direct outlay under working expenses includes share of cost of collection in the Civil Department.

Works in Sind for and up to the close of 1882-83.

OPERATION.

Revenue Accounts are kept.		Grand Total.	Irrigation and Navigation Ordinary Works for which only Revenue Accounts are kept.						Remarks.
Fuleli Canal.	Total.		Under Executive Engineer, Shikárpur Canals.	Under Executive Engineer, Ghár.	Uunder Executive Engineer, Hyderabad Canals.	Under Executive Engineer, Fuleli.	Under Executive Engineer, Karáchi Collectorate Canals.	Total.	
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
.....	41,822	4,75,785	...	...	...	...	...	...	Expenditure on and Receipts from Agricultural Works for which Capital and Revenue Accounts are not kept :
.....	3,031	11,301	...	...	...	...	...	...	
.....	44,853	4,87,086	...	...	...	...	...	...	
10,77,561	31,08,438	92,09,745	...	...	...	...	...	...	
43,286	1,39,006	3,70,376	...	...	...	...	...	...	
11,20,847	32,47,444	95,80,121	...	...	...	...	...	...	*Kashmor and Begári Bund.*
19,467	28,978	1,00,526	2,747	6,877	13,560	964	10,837	34,985	Clearance and extension of Buxaliwáh (excluding Sluice) ... ...
1,39,254	7,97,150	11,72,595	2,23,902	3,62,395	4,47,971	21,424	4,26,866	14,82,558	Strengthening and restoring Kashmor and Begári Bund ... ...
1,58,721	8,26,128	12,73,121	2,26,649	3,69,272	4,61,531	22,388	4,37,703	15,17,543	Survey of Unerwáh ...
4,94,887	7,23,261	12,77,143	...	...	...	...	...	...	Maintenance, conservancy and repairs of Kashmor and Begári Bund ...
27,15,064	1,25,18,708	1,89,78,740	...	...	..	...	...	...	Maintenance of garden at Bádáni ... ...
32,09,951	1,32,41,969	2,02,55,883	...	...	...	...	...	...	Do. do. at Buxaliwáh.
1,62,562	6,97,432	5,75,291	1,39,581	1,46,118	2,08,927	23,113	2,45,995	7,63,734	Rent of Telegraph Line and Office at Bádáni ...
4,492	8,159	12,159	...	...	...	...	...	...	Repairing Nurwáh for Kashmor and Begári Bund ... ...
1,67,054	4,05,591	5,87,450	1,39,581	1,46,118	2,08,927	23,113	2,45,995	7,63,734	General Charges for Establishment and Tools and Plant ... ...
32,28,005	64,40,424	99,72,043	...	...	...	...	...	...	Share of collection charges in the Civil Department, Buxaliwáh ... ...
1,02,666	1,89,060	3,26,005	...	...	...	...	...	...	
33,30,671	66,29,484	1,02,98,048	...	...	...	...	...	...	*Add*—Irrigation Share of Land Revenue from Buxaliwáh ... ...
									Total Begári ...
									Executive Engineer, Shikárpur Canals.
									Kasimpur Bund.
—8,333	4,20,537	6,85,671	87,068	2,23,154	2,52,604	—725	1,91,708	7,53,809	Constructing a Sluice on Arorewáh (Zamíndári Canal) in the 8th mile of Kasimpur Bund ... ...
—1,20,720	66,12,485	99,57,835	...	...	...	...	...	...	Maintenance and clearance of Kasimpur Bund ...
									General Charges for Establishment and Tools and Plant ... ...
42,700	1,22,332	3,57,707	...	...	...	..	...	...	Total Shikárpur Canals...
9,65,818	21,36,903	57,87,871	...	...	...	...	...	...	*Executive Engineer Ghár* ...
									Executive Engineer, Eastern Nára ... ...
									Executive Engineer Fuleli .
									Executive Engineer, Karáchi Collectorate Canals ...
—51,033	2,98,205	3,27,966	...	...	...	...	...	...	*Mathematical Instrument Depôt in Sind* ... ...
—10,86,538	44,75,582	41,69,964	...	...	...	...	...	...	Total ...

	Expenditure.	Receipts.
Executive Engineer, Bega'ri.	Rs.	Rs.
Kashmor and Begári Bund.		
Clearance and extension of Buxaliwáh (excluding Sluice)	13,401	(
Strengthening and restoring Kashmor and Begári Bund	70,481	
Survey of Unerwáh ...	561	
Maintenance, conservancy and repairs of Kashmor and Begári Bund ...	39,891	...
Maintenance of garden at Bádáni	479	...
Do. do. at Buxaliwáh.	242	...
Rent of Telegraph Line and Office at Bádáni ...	3,600	...
Repairing Nurwáh for Kashmor and Begári Bund	4,462	...
General Charges for Establishment and Tools and Plant	19,203	...
Share of collection charges in the Civil Department, Buxaliwáh	114	...
		321
Add—Irrigation Share of Land Revenue from Buxaliwáh	...	1,144
Total Begári ...	1,52,434	1,465
Executive Engineer, Shikárpur Canals.		
Kasimpur Bund.		
Constructing a Sluice on Arorewáh (Zamíndári Canal) in the 8th mile of Kasimpur Bund	1,399	...
Maintenance and clearance of Kasimpur Bund ...	8,111	...
General Charges for Establishment and Tools and Plant	2,452	...
Total Shikárpur Canals...	11,962	12
Executive Engineer Ghár ...	...	64
Executive Engineer, Eastern Nára	...	1
Executive Engineer Fuleli .	..	32
Executive Engineer, Karáchi Collectorate Canals ...	...	52
Mathematical Instrument Depôt in Sind	743	803
Total ...	(a) 1,65,139	2,429

(a) Exclusive of Rs. 5,718 debited to Agricultural Works in the accounts of the Executive Engineer, Fuleli, on account of Establishment employed for Surveys in the Sibi District as it does not pertain to Irrigation Works in Sind Province.

Memorandum of Loss to the Canals on account of Difference between Assessments of Water-rates on Jáhgír Lands and Assessments at the Ordinary Rates in force for Government Lands.

Works.	Loss.			Remarks.
	To end of 1881-82.	During 1882-83.	Total.	
Productive Public Works.	Rs.	Rs.	Rs.	
Desert Canal	21,904	14,304	36,208	
Begári do.	46,471	38,829	85,300	
Eastern Nára Works...	2,433	995	3,428	
Total Productive Public Works ...	70,808	54,128	1,24,936	
Irrigation and Navigation Works for which Capital and Revenue Accounts are kept.				
Sukkur Canal	786	1,051	1,837	
Ghár do.	10,646	12,369	23,015	
Alibhar Kacheri Canal	6,454	1,995	8,449	
Márak Great Canal	33,563	8,310	41,873	
Sarfrázwáh	17,707	2,478	20,185	
Fuleli Canal	3,31,839	69,716	4,01,555	
Total Works for which Capital and Revenue Accounts are kept ...	4,00,995	95,919	4,96,914	
Works for which only Revenue Accounts are kept.				
Under Executive Engineer, Shikárpur Canals .	.....	6,125	.....	
Do. do. Ghár	.....	20,099	.....	
Do. do. Hyderabad Canals .	.....	43,509	.....	
Do. do. Fuleli ...	.....	8,877	.....	
Do. do. Karáchi Collectorate Canals	.....	22,962	.....	
Total Works for which only Revenue Accounts are kept	.....	1,01,572	.....	
Total Irrigation and Navigation ...	.....	1,97,491	.....	
Grand Total ...	.....	2,51,619	.....	

W. I. LeBRETON,
Officiating Examiner of Public Works Accounts.

Bombay, 27th November 1883.

BOMBAY: PRINTED AT THE GOVERNMENT CENTRAL PRESS.

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1883-84.

B 1429

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1883-84.

B 1429

INDEX.

	Pages.
Letter from the Superintending Engineer for Irrigation in Sind, No. 325, dated 4th February 1885	1
General review of the results for the whole Province of Sind	3 to 9
Begári Canals	9 to 11
Shikápur Canals	12 & 13
Ghár Canals	13 to 15
Eastern Nára Canals	16 & 17
Hyderabad Canals	17 & 18
Fuleli Canals	18 to 20
Karáchi Canals	20 & 21
Memo. from the Commissioner in Sind, No. 666, dated 20th February 1885 ...	22
Tables accompanying Superintending Engineer's letter, I. to IX.	23 to 31
General Abstract of Financial results for and up to the close of 1883-84 ...	32 & 33
Memo. of loss to Canals on account of difference between assessments of water-rates on Jághír lands and the assessment at the ordinary rates in force for Government lands	34
Chart showing readings at Kotri and Rukkur Gauges for 1883.	
Index Map of the Province of Sind.	

No. 325 OF 1885.

PUBLIC WORKS DEPARTMENT.

To

THE SECRETARY TO GOVERNMENT,

Public Works Department (Irrigation),

Bombay.

Camp Madeji, 4th February 1885.

SIR,

I have the honour to forward herewith my Irrigation Revenue Report for the year 1883-84, with the usual tables, charts, and a copy of the Index map of Sind, which was recently revised at the request of the Commissioner in Sind.

2. The report is, I regret to say, about 2½ months behind time: but I only received the copy of the jamábandi statements of Upper Sind Frontier during the Christmas holidays and that of the Collectorate of Shikárpur on the 21st January 1885; this, adding to the rather unusual press of office and new work which I have had since I moved out on the annual tour of inspection, prevented me from completing the Revenue Report in time.

3. Attached to the report is the general abstract of the financial results prepared by the Examiner Public Works Accounts.

I have the honor to be,

Sir,

Your most obedient Servant,

J. E. WHITING, M.A., M.INST.C.E.,

Acting Superintending Engineer for Irrigation in Sind.

Forwarded through the Commissioner in Sind.

ANNUAL REVENUE REPORT

OF THE

IRRIGATION DEPARTMENT IN SIND FOR 1883-84.

1. The river rose fairly well in June and kept on steadily up to the 17th, when it stood at 11′ 3″. Between the 18th June and 17th July its level fluctuated between 9′ 8″ on the 28th of June to 15′ 11″ [maximum height for the year] at Bukkur on the 17th of July against 15′ 2″ on the corresponding date of the previous year. From this date and up to the 24th of that month it stood at a fair height: but after that it began to fall, and on the 3rd September, a period when water is indispensable, it had gone down as low as 9′ 11″ against 11′ 11″ of the previous year. It rose again to 12′ 9″ on the 9th, but only remained up for 6 days, and then the final fall commenced. The curve of the river, which is shown on the chart attached to this report, both for the Bukkur and Kotri gauges, shows a series of rises and falls only once approaching that necessary for a good supply, and represents therefore a bad inundation, its fluctuating nature being its chief and worst characteristic.

2. The low inundation however was of course favourable as regards protective embankments generally. There were a few insignificant breaches which were promptly filled in and closed: but there was much erosion of the river banks at several important points. A loop line had to be constructed, for instance, at the 11th mile of the Sukkur-Begari bund, and great fears were entertained for the Mitho bund at the mouth of the Fordwáh and for the Customs buildings at Keti Bandar.

3. Notwithstanding the lowness of the inundation and the deficient supply in nearly all the canals, the results of the season's operations, as will be seen from the table below showing the areas of kharíf and rabi and the water share of net consolidated assessments since 1878, are not so bad as might have been anticipated. Further remissions are, however, certain—*see* para. 16 :—

Years.	Area of Cultivation.			Irrigation share of Net Consolidated Assessments.	Remarks.
	Kharíf.	Rabi.	Total.		
	Acres.	Acres.	Acres.	Rs.	
1878-79	1,333,546	551,769	1,885,315	29,57,160	Flood.
1879-80	1,114,510	228,243	1,342,753	27,72,085	
1880-81	1,172,384	156,278	1,328,662	28,43,067	
1881-82	1,260,108	158,821	1,418,929	*32,28,947	
1882-83	1,281,691	226,601	1,508,292	*32,02,048	Flood.
Average	1,232,448	264,342	1,496,790	30,00,661	
1883-84	1,197,513	164,594	1,362,107	31,68,358	
Difference	— 34,935	— 99,748	— 134,683	+1,67,697	

*The figures for these years have been modified owing to certain corrections which had to be made on account of revenue on fallow lands, which was remitted, in the Hyderabad Canals District and the village cess which were noticed in last year's report. *Vide* pages 1 and 16 of the same.

It will be seen that though the returns for the year show a decrease of 134,683 acres of cultivation, *i. e.* 34,935 acres of kharif and 99,748 acres of rabi, there is yet an increase of Rs. 1,67,697 of water share of net consolidated assessment on the average of 5 previous years. Comparing them, however, with those for the preceding year the result is a decrease in kharíf and rabi cultivation of 84,178 and 62,007 acres respectively, and Rs. 33,688 in water share of net consolidated assessments under both heads.

4. With such an indifferent inundation as that of the year under review, the question arises how it is that the result of the season's operations, as compared with the average of 5 previous years, shows a decrease of 134,683 acres of cultivation and yet an increase of Rs. 1,67,697 of net consolidated assessments. The answer is apparently that the enhancements in some of the recent revision settlements in the Province due to an added charge for the use of increased water-supply [of which advantage was taken without payment by occupants during the currency of previous settlements] contributed largely in bringing about a satisfactory result, and had it not been for this the falling off in revenue would have been considerable. The probable remissions must also be noted.

5. The following table shows in detail the water share of net consolidated assessments for the year of report and for the previous one, and the increase or decrease of revenue in each Executive district separately :—

	1882-83.	1883-84.	Difference.
	Rs.	Rs.	Rs.
Begári Canals	3,08,030	2,95,175	— 12,855
Shikárpur Canals	2,30,962	2,09,065	— 21,897
Ghár Canals	11,77,084	11,09,136	— 67,948
Eastern Nára Canals	1,21,704	1,63,660	+ 41,956
Hyderabad Canals	5,73,536	5,30,898	— 42,638
Fuleli Canals	3,44,072	3,99,989	+ 55,917
Karáchi Canals	4,46,660	4,60,435	+ 13,775
	32,02,048	31,68,358	— 33,690

The decreases in the Begári, Shikárpur, Ghár and Hyderabad Canals are due entirely to the diminished area cultivated owing to the lowness of the inundation. The increase in the Eastern Nára Canals is due to an increase of 17,245 acres of cultivation, a great part of which is due the Mithrau Canal owing to the greater security afforded by the new protective embankment. The increase in the Fuleli Canals is considerably due to enhanced rates levied under the new settlement in the Guni Táluka and partly to an increase of 6,875 acres of cultivation. The increase in the Karáchi Canals is due chiefly to increased rates of assessments in the Jerruck and Sháhbandar districts, and to a small extent to the revenue from the Shal Jághír Canals, aggregating a total length of 18 miles, which lapsed and were brought on the list of Government Canals—the area irrigated under both kharíf and rabi being 1023 acres and revenue Rs. 1,639.

6. How far the productive capacity of the Province is affected by a good or bad inundation can be seen from the following table in which the results of the inundations of 1882-83 are compared with those of 1883-84 :—

	1882-83.			1883-84.			Difference.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Begári Canals	165,522	10,524	176,046	153,223	9,691	162,914	—12,299	—833	—13,132
Shikárpur Canals	82,590	22,536	105,126	71,767	15,413	87,180	—10,823	—7,123	—17,946
Ghár Canals	365,948	73,796	439,744	299,837	63,665	363,502	—66,111	—10,131	—76,242
Eastern Nára Canals	59,389	15,948	75,337	67,161	25,421	92,582	+7,772	+9,473	+17,245
Hyderabad Canals	262,135	30,015	292,150	257,155	8,562	265,717	—4,980	—21,453	—26,433
Fuleli Canals	160,172	11,930	172,102	172,986	5,991	178,977	+12,814	—5,939	+6,875
Karáchi Canals	185,935	61,852	247,787	175,384	35,851	211,235	—10,551	—26,001	—36,552
	1,231,691	226,601	1,508,292	1,197,513	164,594	1,362,107	—84,178	—62,007	—146,185

Probably some amount of rabi cultivation in 1882-83 was grown on flooded lands after the breaching of embankments. Details of the results in the several Executive charges will be given further on.

7. The net canal revenue, that is, the water share of the net consolidated assessment on the year's cultivation and due for collection *plus* hakaba on jághírs and miscellaneous receipts, which are actual collections for the several irrigation charges, is shown in the table below which gives the figures since 1878 by way of comparison:—

Years.	Begári Canals.	Shikárpur Canals.	Ghár Canals.	Eastern Nára Canals.	Hyderabad Canals.	Fuleli Canals.	Karáchi Canals.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1878-79	2,09,362	2,30,156	8,58,919	2,86,321	6,84,686	3,28,382	4,42,608	30,40,434
1879-80	2,13,335	1,95,758	8,45,700	1,68,021	6,09,523	3,73,810	4,47,060	28,53,207
1880-81	1,91,186	2,01,920	8,52,004	2,08,468	5,66,958	3,82,634	5,40,862	29,44,032
1881-82	2,65,078	2,40,293	10,99,398	1,75,404	5,94,086	4,03,576	5,67,906	33,45,741
1882-83	3,59,321	2,33,721	11,89,426	1,42,253	5,91,206	3,64,535	4,58,352	33,38,844
Average	2,47,656	2,20,370	9,69,089	1,96,099	6,09,292	3,70,587	4,91,358	31,04,451
1883-84	3,41,953	2,12,270	11,23,953	1,35,596	5,48,060	4,21,324	4,73,896	33,07,052
Difference	+94,297	−8,100	+1,54,864	−10,503	−61,232	+50,737	−17,462	+2,02,601

The figures in this table show generally that the result of the season's operations compares favorably with the average of 5 previous years, the increase being Rs. 2,02,601. It may be necessary, however, to notice a few points in regard to hakaba on jághírs and miscellaneous receipts. First as to jághír lands. The area irrigated during the year is 178,724 acres, the actual collection being Rs. 85,134, against an area of 165,001 acres and an actual collection of Rs. 87,057 of the previous year. This would appear unsatisfactory, as, notwithstanding the fact that the area cultivated in the preceding year was less by 13,723 acres yet the collection was more by Rs. 1,923. The reason for this is that much of the assessment due for and on account of the area cultivated during the year was not wholly recoverable as will be seen from the figures in the following table :—

	Area cultivated during the year.	Unrealised Balance at end of last year.	Assessment of the year.		Total.	Remissions during year.	Net Total realizable.	Actual Realizations during the year.	Balance unrealizable at the end of current year.
			Area.	Amount.					
	Acres.	Rs.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Khelat	65,588	70,458	65,587	69,492	1,39,950	2,084	1,37,866	42,692	95,174
Frontier	822	83	822	307	390	..	390	54	336
Shikárpur	20,021	3,396	20,021	7,932	11,328	..	11,328	7,316	4,012
Thar and Párkar	647	21	647	339	360	..	360	360	....
Hyderabad	74,286	19,036	190,703	30,767	49,803	..	49,803	30,005	19,798
Karáchi	17,360	1,479	17,360	4,282	5,761	..	5,761	4,703	1,058
Total ..	178,724	94,473	279,140	1,13,119	2,07,592	2,084	2,05,508	85,130	1,20,378

8. It would appear then that the assessment due for the area irrigated during the year is much more than what was actually collected. The area is greater than that of the previous year by 13,723 acres, as above noted: 11,941 of these are due to an apparent increase of cultivation in Khelat, which is attributed partly to the better supervision now exercised over the measurements of the lands there, and partly to the fact that some of the 7 years' leases having expired they are now renewed for one year only at an enhanced rate of one rupee per bigha on actual cultivation. The difference between the assessment and the collection is shown in the large outstanding balance of the Province, the greater part being due from the Khelat landholders, in reference to which it may be mentioned that about Rs. 20,000 have already been recovered and paid into the British treasury, and the Vakíl of His Highness the Khán of Khelat has been

ordered by the Political Agent at Jacobabad to collect and pay in the remainder as soon as possible. The balances outstanding against the Shikárpur and Hyderabad Collectorates are large also: but it appears that every endeavour is being made by the Revenue authorities to recover and reduce such outstandings to a minimum. Next as to miscellaneous receipts, such as sale proceeds from plantation, canal produce, navigation, fines, &c., it will be sufficient to say that taking the Province as a whole there is an increase of Rs. 3,823 over the receipts of the preceding year; the greater part of this comes from the Ghár and Eastern Nára Canals.

9. The direct and indirect receipts of canal revenue are shown in Tables VI. and VI. A. In the former table are shown the irrigation share of the net consolidated assessments on the year's cultivation as given in Canal Return VIII., furnished by the Collectors and Deputy Commissioners as also the hakaba and miscellaneous receipts, which two latter show actual collections. In Table VI. A. are shown the water share of the actual receipts of net consolidated revenue and the hakaba and miscellaneous receipts.

10. The actual realizations of consolidated revenue during the year as shown in Canal Return VIII. A. furnished by the Revenue authorities for the several districts and collectorates are shown below:—

	Total for collection.	Actual receipts.	Balance outstanding.	Irrigation share of collection.
	Rs.	Rs.	Rs.	Rs.
Frontier Districts	4,01,219	3,44,383	56,836	3,09,945
Shikárpur Collectorate	15,52,331	14,55,525	96,806	13,09,977
Thar and Párkar Districts	1,72,475	1,71,522	953	1,54,370
Hyderabad Collectorate	11,60,968	9,73,528	1,87,440	8,76,175
Karáchi do.	5,49,889	5,13,363	36,526	4,62,027
Total ...	38,36,862	34,58,321	3,78,561	31,12,494

The irrigation share of realizations [also shown in Table VI. A. which is taken from the general revenue accounts furnished by the Examiner of Public Works Accounts] is Rs. 31,12,494. The balance outstanding under this head, as in the case of hakaba on jághírs, is very heavy.

11. The areas of kharíf and rabi and the consolidated assessments are shown in Table VII. The figures are taken from Canal Return VIII. furnished by the Revenue authorities.

12. The remissions given during the year and six previous years are shown in the table below:—

Executive Charges.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	Average.	1883-84.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	8,301	899	213	1,955	..	..	1,895	4,685
Shikárpur Canals	16,869	16,859	691	1,415	58	842	6,122	6,814
Ghár Canals	9,790	82,061	4,212	12,198	9,268	66,818	30,725	17,312
Eastern Nára Canals	7,259	1,08,987	1,762	2,928	2,504	13,476	22,819	910
Hyderabad Canals	10,427	23,384	58,005	20,216	911	19,817	21,960	493
Fuleli Canals..	14,937	61,308	929	2,622	2,917	5,248	14,660	1,036
Karáchi Canals	41,818	48,205	32,159	23,423	19,194	1,06,505	45,217	61,621
Total ..	1,09,401	3,41,703	97,973	64,757	34,852	2,11,706	1,43,398	92,871

The remission for the year of report is less by Rs. 1,18,835 and Rs. 50,527 as compared with those given in the previous year and the average of six previous ones; but it should be mentioned, however, that the remission for the year should really be larger than shown, as it appears that a sum of Rs. 36,088 was sanctioned on account of remissions in the Hyderabad Collectorate after the 31st July last, and could not therefore be entered in the Huzúr Deputy Collector's returns; and further that about Rs. 30,000 are likely to be sanctioned for the Guni Táluka. The whole of the remissions shown against the Begári

Executive charge are due to the Begári Canal, Rs. 4,268 of which were given for that portion of the canal which lies in the Frontier Districts and Rs. 420 for that in the Shikárpur Collectorate. The details of the remissions recorded against the other Executive charges are shown in Table VII., and it appears generally that the unfavourable nature of the inundation necessitated them.

13. The revenue expenditure during the year on the several canals in the Province is shown in detail in Table IV. The several heads of expenditure for the year and six previous ones are shown below :—

Years.	Maintenance and Repairs.			Revenue Collection Charges.	Total.
	Works.	Establishment.	Total.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1877-78	6,65,741	2,25,413	8,91,154	2,43,789	11,34,943
1878-79	6,20,312	2,34,109	8,54,421	2,54,089	11,08,510
1879-80	6,87,162	2,38,070	9,25,232	2,38,744	11,63,976
1880-81	7,32,956	2,07,752	9,40,708	2,48,897	11,89,605
1881-82	8,86,044	2,12,897	10,98,941	2,74,070	13,73,011
1882-83	8,68,991	2,22,036	10,91,027	2,72,052	13,63,679
Average	7,43,534	2,23,380	9,66,914	2,55,274	12,22,287
1883-84	8,78,816	2,14,128	10,92,944	2,74,762	13,67,706
Difference... ...	+1,35,282	−9,252	+1,26,030	+19,488	+1,45,419

In addition to the above a sum of Rs. 1,40,694 was expended on extensions and improvements and Rs. 29,107 on establishment. The total revenue expenditure therefore was—

Extensions and Improvements ...	... Rs.	1,40,694	
Maintenance and Repairs	... „	8,78,816	
			10,19,510
Establishment Public Works Department	... „	2,43,235	
Do. Revenue Department...	... „	2,74,762	
			5,17,997
Total	... Rs.		15,37,507

14. The percentage of expenditure on revenue and the cost of maintenance per acre during the year of report and for the six previous years was as below :—

	Cultivation.	Net Canal Revenue.	Maintenance and Repairs and Revenue Collection Charges.	Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.
	Acres.	Rs.	Rs.	Rs.	Rs.
1877-78...	1,418,863	27,40,618	11,34,943	41·41	·80
1878-79...	2,016,089	30,40,434	11,08,510	36·46	·55
1879-80...	1,454,028	28,53,207	11,63,976	40·80	·80
1880-81...	1,492,669	29,44,032	11,89,605	40·41	·79
1881-82...	1,601,986	33,45,741	13,73,011	41·04	·86
1882-83...	1,673,293	33,38,844	13,63,679	40·84	·82
Average	1,609,488	30,43,813	12,22,287	40·16	·76
1883-84...	1,540,831	33,07,052	13,67,706	41·36	·88

The percentage of expenditure on revenue is a little in excess of that of the previous year and the cost of maintenance per acre for the year is 14 annas and 1 pie.

15. The percentage of cost of public works establishment on the expenditure incurred on maintenance and repairs was for the whole Province 24·37 and for each Executive charge separately :—

Begári Canals	...	...	27·74
Shikárpur Canals	...	...	15·15
Ghár Canals	...	...	19·65
Eastern Nára Canals	...	...	28·46
Hyderabad Canals	...	...	27·57
Fuleli Canals	...	...	27·80
Karáchi Canals	...	...	24·74

The percentage for the Province is lower than what it was in the previous year, and this is due to an increase in the expenditure and a decrease in the establishment charges by Rs. 9,825 and Rs. 7,908 respectively : but taking to account the establishment charges due to expenditure incurred on extensions and improvements, as shown in Table IV., there is an increase of Rs. 857 as compared with that for the previous year. The excess is due chiefly to direction and accounts, as a portion of the establishment charges of the Superintending Engineer for Irrigation in Sind which was formerly debited to the Buildings and Roads branch on account of outlay incurred by the Executive Engineer, Lower and Central Sind, has been debited in the year of report to irrigation works alone as the Executive charge mentioned has been placed under the direct orders of Government.

16. There has been an increase in the mileage of canals and bunds in the Province by 106 and 62 miles respectively ; the total for the year is shown in Table V., being 5,701 and 524 against 5,595 and 462 of the previous year. Of the increase in the canal mileage 13 miles are due to the Desert Canal, 34 to the distributaries of the Ghár, 14 to the Gowarwáh ex Western Nára, 20 to the Eastern Nára distributaries from the Nára Bund, 7 to the Thar Canal, and 18 to the lapsed Shal Jághír Canals. Of the increase of mileage in the bunds 1 is due to the Káshmor Bund, 28 to the Mithrao Canal Protective Embankment and 33 to the Thar Canal Protective Embankment.

17. The irrigating duty per cubic of supply for some of the principal canals is shown in Table VIII. and remarks on the subject will be made when the canals concerned are treated individually : in general the duty compares favorably with that of the previous year.

18. The rainfall in the Province during the year is shown in Table IX., and it may be remarked that the rain in June and September was of no importance, while what fell in July benefited dry-crops somewhat, but was prejudicial to rice crops.

19. The general abstract of financial results as prepared by the Examiner of Public Works Accounts is attached to this report, and it may be mentioned that the figures to the end of the previous year exhibited therein do not agree in some cases with those shown in the abstract for 1882-83, the difference being due to certain adjustments which have been effected in the administrative accounts for 1883-84, The results recorded in the abstract for the year may be summed up thus :—

Class of Works.	Gross Revenue.	Working Expenses.	Net Revenue.	Simple Interest.	Net Profit.
	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Public Works ...	4,91,926	1,83,594	3,08,332	2,52,707	55,625
Ordinary Irrigation and Navigation Works for which Capital and Revenue Accounts are kept	8,73,549	3,91,602	4,81,947	...	4,81,947
Do. do. for which only Revenue Accounts are kept .	14,41,042	8,83,032	5,58,010	...	5,58,010
Total ...	28,06,517	14,58,228	13,48,289	2,52,707	10,95,582

It will be seen that the interest charges for the class of works for which Capital and Revenue Accounts are kept have been omitted for the first time under the orders of the Government of India.

20. There is also another class of works which exist in Sind, namely, "Works for which neither Capital nor Revenue Accounts are kept." To this the Káshmor and Kásimpur Bunds appertain and the detail of expenditure on and receipts from the same are subjoined to the General Abstract of Financial results alluded to above.

21. The amount of loss to the canals on account of assessments of water-rates on jághir lands and the assessments at ordinary rates in force for Government lands is given in the memorandum subjoined to the General Abstract of Financial results. The net assessment at rates applicable to jághir lands is Rs. 1,13,119 : the net assessment at ordinary rates in force for Government lands would have been Rs. 3,61,698, and the amount of loss to the canals concerned was Rs. 2,48,579.

22. Having proceeded thus far with the general review of the results for the whole Province, the details of the operations for the several canals may be treated separately.

FRONTIER, UPPER SIND.

Begári Canals.

Desert Canal.

23. The widening of the Desert Canal from the Regulator to the 57th mile and its extension to the 69th mile at Salami Tower, works which were in progress during the working season of 1882-83, were completed in April of the year of report, and the canal was opened on the 27th May, water reaching the tail on the 31st; but as the supply in the canal in the beginning of June was deficient the water in the new extension was cut off as soon as the Rajwáhs in British territory and kurriahs in Kelat were opened. On the 29th June, however, water again reached the tail, and after the middle of July a supply sufficient for the wants of the cultivators was maintained up to the end of the season. The mouth of the canal worked well throughout the season and the deficient supply in June was solely due to the low state of the river. The Murádwáh branch of this canal was also opened on the 27th and the supply was fairly good throughout the season with the exception of a few days in June.

24. The areas of kharíf and rabi and the assessed revenue on the Desert Canal and on its branch the Murádwáh, as compared with those for the previous year, is shown in the following table :—

	Cultivation.			Assessed Revenue.			Remissions.	Net Assessment.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.		
Desert Canal—	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.
1882-83	59,737	1,322	61,061	1,08,212	2,644	1,10,856	..	1,10,856
1883-84	39,857	3,155	43,012	77,142	5,035	82,177	..	82,177
Increase or Decrease..	−19,882	+1,833	−18,049	−31,070	+2,391	−28,679	..	−28,679
Murádwdh—								
1882-83	8,194	2,614	10,818	16,037	5,219	21,256	..	21,256
1883-84	10,222	2,256	12,478	20,654	4,214	24,868	..	24,868
Increase or Decrease..	+2,028	−358	−1,660	−4,617	−1,005	+3,612	..	+3,612
Land in Kelat—								
1882-83	21,718	121	21,839	21,718	121	21,839	7,618	14,221
1883-84	25,128	3,309	28,437	28,033	3,309	31,392	..	31,392
Increase or Decrease..	+3,410	3,188	+6,598	+6,365	+3,188	+9,553	7,618	+17,171

The decrease on the Desert Canal in British territory, 19,657 acres of which may be set down against the Kashmor and Thul Tálukás in the sum of 15,548

and 4,109 acres in each, is large indeed : but the falling off is not attributable so much to defect in water-supply as to other causes, as it appears that the Zamindárs in these two tálukás allowed their lands to lie fallow to recover from over-cultivation, one Zamindár alone to the extent of about 8,000 acres. It is probable, however, that the greater part of the old land as well as some new that has been taken will cause the cultivation of 1884-85 to be equal in area to that of 1882-83, if not more. The increase of cultivation on lands in Kelat watered by the Desert Canal is satisfactory. This result is due to actual increase of cultivation, for though the water-supply was indifferent at the beginning of the season, it was equal to the wants of the cultivators later on. For the increase on the Murádwáh a similar cause may be attributed. The total net result of the Desert Canal is a decrease of 9,781 acres of cultivation and 7,896 rupees of net assessed revenue as compared with the previous year.

25. The charges on account of maintenance and repairs during the year were Rs. 20,404, which includes Rs. 5,659 for establishment and tools and plant : the cost of revenue collection was Rs. 9,483, and the total charges against revenue Rs. 29,887 or Rs. 8,537 more than in the previous year, the excess being due to increase in the establishment charges and to increased expenditure on repairs. The net revenue realized during the year was Rs. 79,355, and the interest charges for the year were Rs. 39,234 ; the net profit during the year was therefore Rs. 40,121, and the balance of net revenue to the end of the year was Rs. 4,29,455 against Rs. 3,89,334 of the previous year. The loss on account of hakába on land in Kelat territory and jághirs in Upper Sind Frontier was Rs. 25,114 for the former and Rs. 998 for the latter. The receipts on hakaba from jághirs in British territory were Rs. 4 against an assessment of Rs. 194.

26. The average discharge of the Desert Canal proper was for the 111 days from the 7th June to the 25th September 1,109 cubic feet per second, but adding to this 40 cubic feet as the discharge of the old Maksuda the total average discharge is 1,149 against 1,305 of the previous year, *i.e.* a decrease of 156 cubic feet, which is due in a great measure to the inability to pass the full supply into the canal owing to the closure of Baksha Khán's canal. The total kharíf area cultivated in British territory and in Kelat, as well as the jághir land in British territory, both paying and not paying hakába, was 74,424 acres. Adding to this an area of 7,703, which, as in the previous year, was flooded during the kharíf season and afterwards sown with a rabi crop, the total area irrigated was 85,282 and the duty is 74·22 acres to the cubic foot. The average discharge of the Murádwáh was 308 cubic feet per second and the kharíf area irrigated was 10,223 acres. Adding to this, as in the case of the main canal, the rabi area of 2,256, the total area irrigated was 12,479 acres and the duty 40·51 acres to the cubic foot.

Begári Canal.

27. The Begári Canal was opened on the 27th May and on the morning of the 28th the up stream gauge at the Head Regulator read 8′·20, but only 3′·20 was admitted. As none of the kurriahs were opened the whole of the water had to be forced down to the tail of the main canal and its branches and the Regulator at the tail of the Begári read 7′ on the morning of the 30th idem, which caused a breach on the right bank in the 76th mile, which was closed : but another occurred on the left bank on the 2nd June, which also was closed. No more breaches occurred after these in the lower part of the canal, although on the 17th July the gauge read 8′·90, *i. e.* 1′·69 above full supply. Both the breaches mentioned above were caused by rat holes. Owing to no kurriahs having been opened also in the lower part of the canal until the middle of June, needles had to be kept at the head and 19th mile Regulators, so that with the exception of the Sonwáh above the 19th mile Regulator no benefit was derived from the favourable supply above the Head Regulator between the 10th and 17th June ; but after that needles were not required and were only introduced into the 19th mile Regulator with the view of obtaining a better supply for the crops on the Sonwáh. On the whole the inundation was not unfavourable to the Begári and its branches as the supply delivered was equal to the wants of the cultivators and there has been an increase in the area cultivated and the net assessed revenue.

The result of the season's operations as compared with those of the previous year are shown below: —

	Cultivation.			Assessed Revenue.			Remissions.	Net Assessed Revenue.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.		
Frontier Districts.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.
1882-83	78,492	3,496	81,988	1,57,457	3,239	1,60,696	...	1,60,696
1883-84	89,472	2,165	91,637	1,81,757	3,805	1,85,562	4,265	1,81,297
Increase or Decrease...	+10,980	—1,331	+9,649	+24,300	+566	+24,866	4,265	+20,601
Shikárpur.								
1882-83	19,064	2,480	21,544	42,332	5,844	48,176	...	48,176
1883-84	13,627	38	13,665	35,692	131	35,823	420	35,403
Increase or Decrease...	—5,437	—2,442	—7,879	—6,640	—5,713	—12,353	420	—12,773
Kelat.								
1882-83	29,643	2,165	31,808	32,490	2,209	34,699	4,495	30,204
1883-84	36,942	209	37,151	37,888	212	38,100	...	38,100
Increase or Decrease...	+7,299	—1,956	+5,343	+5,398	—1,997	+3,401	4,495	+7,896

28. With reference to the above figures it may be mentioned that the increase is due entirely to enlarged cultivation in the lower reaches of the canal where the supply was good. It may be noted also that as the Zamindárs have gained confidence in the stability of the new embankments a greater increase may be expected next year.

29. The charges on account of maintenance and repairs were Rs. 42,164 including Rs. 13,329 for establishment and tools and plant; the cost of revenue collection was Rs. 17,084, and the total revenue expenditure therefore Rs. 72,577. The percentage of expenditure on revenue was 32·09 and the cost of maintenance per acre 0·50. The net revenue realized during the year was Rs.1,25,474 and the interest charges were Rs. 57,100, the net profit during the year was therefore Rs. 68,374 and the balance of net revenue to the end of the year Rs. 3,97,128.

30. The discharge of the Begári for 103 days from the 15th June up to the 25th September was 3,153 cubic feet per second against 3,791 of the previous year. The area irrigated during the kharif was 150,172 acres which includes jághir lands in the Frontier and in Shikárpur; but in addition to this there was an area of 2,810 acres flooded during the kharif and sown afterwards with a rabi crop: the total area irrigated therefore was 152,982 acres and the duty is 48·52 acres to the cubic foot of supply.

Káshmor Bund.

31. The first spill reached the Káshmor Bund in the beginning of May and the 37th mile gauge read 4·10 on the 6th, but subsided and did not again touch the Bund until the 29th idem. The Abkalani establishment was appointed on the 27th May and commenced patrolling immediately: but except from the 17th to the 22nd July there was never any great strain on the bund. During this rise the only leak of the season occurred at 40m. 5f. which was opened and re-filled without much trouble. The expenditure incurred on strengthening the bund during the year was Rs. 15,481 and the cost of constructing fall on Miraniwáh Rs. 4,657 and re-opening Nurwáh Rs. 2,237. The cost of maintenance and conservancy was Rs. 40,497. There were 2,122 acres of cultivation on the Bakshaliwáh and Nurwáh yielding a revenue of Rs. 3,804. Adding to this the sum of Rs. 422 on account of miscellaneous receipts the total receipts to the credit of the bund are Rs. 4,226. The total expenditure on the bund was Rs. 24,688 for improvements including establishment and Rs. 58,316 for maintenance and repairs including establishment and revenue collection charges.

32. Considerable progress has been made in tree-planting on the bund. At the end of last inundation there were 11,400 trees alive. But owing to the

extensive repairs carried out during the working season about 3,500 had to be cut down ; but the additions during the inundation raised the number to 1,700. Those planted in former years afford a useful shade for the establishment while patrolling.

SHIKÁRPUR COLLECTORATE.

SHIKA'RPUR CANALS.

Canals and Bunds in Rohri.

33. The lowness of the inundation had, as might be expected, a bad effect on the culturable area commanded by the canals and bunds in the Rohri districts; the area irrigated and the revenue both decreased as will be seen from the following figures :—

CANALS IN ROHRI.

Year.	Cultivation.			Assessed Revenue.			Remissions.			Net assessed revenue.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs	Rs.	Rs.	Rs.
1882-83	37,210	14,138	51,348	89,809	30,966	120,775	250	..	250	1,20,525
1883-84	33,171	10,520	43,691	86,946	28,933	115,879	2,107	3	2,110	1,13,769
Difference ..	−4,039	−3,618	−7,657	−2,863	−2,033	−4,896	+1,857	3	1,860	−6,756
BUNDS IN ROHRI.										
1882-83	3,222	599	3,821	7,867	159	8,026	..	..	..	8,026
1883-84	1,740	565	2,305	6,128	2,087	8,215	2,427	..	2,427	5,788
Difference ..	−1,482	−34	−1,516	−1,739	+928	+189	+2,427	..	2,427	−2,238

While this decrease as well as the remissions are due chiefly to the poorness of the inundation : but also to some extent to other causes—for instance, the dhand from which the Masuwáh derives its supply had almost entirely silted up and its supply was consequently affected—also a large quantity of the jowári was planted late and rice cultivation suffered from the sudden fall in the river—and as the Maharowáh depends on floods for a full supply rice crops at the tail failed. Again the river having eroded the bank at its mouth threw a lot of silt into the Dengrowáh and affected its supply. A similar cause affected the supply in the Koraiwáh. As to the Arowáh and Umarkus the cultivators were late with their operations. The expenditure on maintenance and repairs was for the canals Rs. 39,476 including establishment and tools and plant, and Rs. 10,250 for revenue collection charges, and for the bunds Rs. 8,799 for maintenance and repairs inclusive of establishment and tools and plant, and Rs. 520 on account of revenue collection.

Sind Canal.

34. The result of the season's operations as regards the Sind Canal was very unsatisfactory as will be seen from the following figures :—

Years.	Cultivation.			Assessed Revenue.			Remission.			Net assessed revenue.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.
1882-83	42,158	7,799	49,957	1,18,911	9,755	1,28,666	592	..	592	1,28,074
1883-84	36,856	4,328	41,184	1,06,222	8,792	1,15,014	2,277	..	2,277	1,12,737
Difference	−5,302	−3,471	−8,773	−12,689	−963	−13,652	+1,685	..	+1,685	−15,337

This canal was opened on the 1st June and the supply was insufficient throughout the season owing to the lowness of the inundation. The crops along the bank of the canal in Sukkur and Shikárpur tálukas, *i.e.* in the higher reaches, were assisted considerably by wheels, but those at the tail suffered greatly from want of water. In Naushahro Táluka the Mangár and Mirwáhs, large branches of the Sind, were closed for 2 days in the week and the extra head obtained was of great assistance to the crops on the banks of the Sind in that táluka. Were it not for this and the wheels which were put up in the higher reaches of this canal in the Sukkur and Shikárpur tálukas the falling off would have been much

more than that exhibited. The expenditure incurred on maintenance and repairs was Rs. 15,225, and for establishment and tools and plant Rs. 2,307. The revenue collection charges were Rs. 10,551.

Sukkur-Begári Bund.

35. There was no strain on this bund from the head of water against it at any time during the inundation. No breaches: but the 3 leaks which occurred were immediately secured. During the inundation the river steadily encroached towards the bund between 10m. 5f. 300ft. and 12th mile. The erosion was considerable in June and July, and it was found necessary to construct a new loop from Alivahu to Bhutar, *i. e.* from 10m. 0f. 70ft. to 12m. 2f. 2·569ft. The work was commenced on the 1st August and completed on the 10th September. The length of this new loop is 6,350 feet. For a length of 500 feet at each and at its junction with the original bund, its section is 3 feet above highest flood level of 1882, the top width of 6 feet and slopes of 3 to 1 and 2 to 1 respectively: the intermediate portion is 1 foot above highest flood level of 1882 with top width of 3 feet. The expenditure incurred on the new loop and restoration to the bund was Rs. 43,609, and Rs. 6,609 on account of establishment and tools and plant. The charges on account of maintenance and repairs including establishment and tools and plant were Rs. 23,662.

GHAR CANALS.

Sukkur Canal.

36. The Sukkur Canal and its branches the Maksuda and Birokur were opened on the 16th June, and the Khairokur on the 28th June. Hardly any of the zamindári kurriahs were opened in June and it was not possible therefore to send down a full supply until the beginning of July, as even the small quantity passed down breached the banks in the Sujával Táluka. From the 6th to end of July the canal was running full. The supply then fell for eight days, when the second rise in the river enabled a full supply to be sent down for 14 days. This was followed by 14 days of very low supply, and then as the crops were getting in a critical state, the old head of the canal was opened, and by this means, aided with a slight rise in the river, a fair supply was kept up for 11 days. Irrigation however has been restricted as will be seen from the following figures :—

Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Khárif.	Rabi.	Total.	Khárif.	Raib.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1880-81	54,649	4,172	58,821	1,05,162	5,192	1,10,354	1·92	1·24	1·87
1881-82	63,165	3,139	66,304	1,16,823	3,825	1,20,648	1·91	1·22	1·82
1882-83	56,024	17,259	73,283	1,41,575	29,515	1,71,090	2·53	1·71	2·33
1883-84	46,468	13,162	59,630	1,21,685	31,810	1,53,495	2·62	2·42	2·57

There was a decrease of 13,653 acres of cultivation and of Rs. 17,595 of net assessed revenue as compared with the previous year. This unsatisfactory result may be explained as follows :—First, as to the decrease of 9,556 acres of cultivation under kharif—this is due to delay in sowing rice and the unusual fall in the river between the 29th July and 8th August, a time when water is much needed, and to the cultivators holding land more especially between the head of the canal and the 42nd mile having lost confidence in the stability of the Sukkur-Begári Bund, as last year their kharif crops were destroyed and they were afraid to sow jowari on lands that had been flooded in the previous year. Next as to the decrease of 4,097 acres of cultivation under rabi—this decrease was the natural result of the late date rice was sown, and the early date on which the river began to fall: these two reasons combined to prevent water from being available for flooding high lands that had been reserved for rabi cultivation. The old head had also silted 3'·7 at mouth during the kharif and rabi season 1882-83 and kharif season 1883, thus decreasing the discharging capacity of the canal during the cold weather of 1883-84. The remission granted fortunately was only Rs. 119.

37. The expenditure on maintenance and repairs was Rs. 21,400, and the charges on account of establishment and tools and plant in the Public Works Department and revenue collection in the Civil Department were Rs. 4,039 and Rs. 6,666 respectively, making a total against revenue of Rs. 32,105. The irrigation share of land revenue together with hakaba and miscellaneous receipts came to Rs. 67,129, the balance of net revenue after deducting charges was Rs. 34,473 as shown in the statement of financial results for the year. The percentage of expenditure on revenue was 23·11 and the cost of maintenance per acre 0·53. The average discharge of the canal was 1,786 cubic feet per second as entered in Table VIII. The total kharif area irrigated was 46,671 acres and the duty 56·85 acres to the cubic foot.

Ghár.

38. Water entered the Ghár as early as the 7th February and the whole supply was passed on to its branch the Nurwáh until the 2nd May, when water was let into all the branches except the three which were taken over, namely, the Hirawáh, Mirwáh, and Chuttawáh and which were opened on the 2nd, 17th and 21st June respectively. The supply was deficient in most of the branches, but during the latter part of the season the supply was fair. The cultivation on the banks of the Ghár suffered most between the 20th and 40th miles: the land here is very high and only suitable for dry crops, as a fall in the supply of even 1 or 2 feet at once deprives it of water, and the result is a decrease in the area cultivated as will be seen from the following figures :—

Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1880-81	199,985	16,459	216,444	4,89,785	24,644	5,14,429	2·45	1·50	2·38
1881-82	182,043	26,223	208,266	5,72,600	55,467	6,28,067	3·14	2·11	3·01
1882-83	207,700	22,565	230,265	6,52,300	72,383	7,24,683	3·14	3·21	3·14
1883-84 . ..	170,523	24,262	194,785	6,20,781	89,696	7,10,477	3·64	1·50	3·65

There is a decrease in the kharif area of 37,177 acres and of Rs. 31,519 of net assessed revenue as compared with the previous year, a very unsatisfactory result indeed, and the chief reason for this was the late date on which rice was sown and transplantation not being completed when the river fell at the end of July. Remission to the extent of Rs. 8,955 was granted and it was exclusively for deficiency of water supply for high-lying lands between the 20th and 40th miles as already noted. There is an increase in the rabi area of 1,697 acres and of Rs. 17,313 of net assessed revenue as compared with the previous year. This is due probably to the high price at which wheat was selling, as the cold weather supply was not assisted, as during the preceding year, by river floods and should therefore have been less instead of more. The increase under rabi compensates a good deal for the decrease under kharif.

39. The expenditure under maintenance and repairs was Rs. 68,919 and the cost of establishment and revenue collection charges Rs. 13,006 and Rs. 53,021, making a total charge against revenue of Rs. 1,34,946. The irrigation share of net assessed revenue with hakaba and miscellaneous collections was Rs. 5,31,979 and the balance of net revenue after deducting working expenses was Rs. 3,87,897; the percentage of expenditure on revenue was 20·94 and the cost of maintenance per acre 0·67. The average discharge of the Ghár was 5,885 cubic feet per second: the total kharif area irrigated was 174,509 acres and the area irrigated per cubic foot of supply 29·65.

Western Nára.

40. The Western Nára flowed throughout the cold weather and the supply during the kharif season was fair, although below that of the two preceding years. The river encroached on the mouth of the canal between the 23rd August and 18th September, eroding 208 feet during this period. There was however a deficiency of water in the Labdarya and Tigar Tálukas and at one time even in the Mehar Táluka, high lands suffering. The low supply lasted from the 27th July to 12th August. The Gowárwáh, which was taken over and added to the list of Government canals, worked well: the crops under it were excellent. The Mundarwáh work-

ed well and besides affording an ample supply to the land under it materially assisted the Chilowáh ex Ghár, on which, but for the assistance, heavy remissions would have been rendered necessary. The Gulmahomedwáh was thoroughly cleared and worked well. The Kakol and Khaimohawáhs worked fairly well. The Kudanwáh was found as usual difficult to supply lands at its tail. The difficulty due to its month silting, which used to be of annual occurrence, has now been overcome successfully by groining and by cutting off a very bad bend near the head. The result of the season's operations is, as in the case of the Sukkur and Ghár canals, unsatisfactory as will be seen from the following figures :—

Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1880-81	77,533	5,434	82,967	2,55,207	11,966	2,67,173	3·29	2·20	·22
1881-82	104,976	21,667	126,643	3,56,823	71,002	4,27,825	3·40	3·27	3·38
1882-83	91,636	31,173	122,809	2,58,949	1,16,910	3,75,859	2·82	3·75	3·06
1883-84	73,867	24,651	98,518	2,52,140	88,962	3,41,102	3·41	3·61	3·46

41. There is a decrease of 24,291 acres of cultivation under both kharif and rabi and of Rs. 34,757 of net assessed revenue as compared with the result of the previous year. This is owing to a deficient supply of water, as at the Abad bridge, *i.e.* 3rd mile of the canal, the maximum depth in June 1883 was 10·40 against 13·65 in 1882; in July 14·10 against 15·25; in August 12·65 against 15·25; and in September 12·10 against 13·15. A large decrease therefore was to be anticipated. Remissions to the extent of Rs. 5,304 were granted owing to crops failing for want of sufficient water at the most critical time, namely, August. The cost of maintenance and repairs was Rs. 51,700, the establishment charges in the Public Works and Revenue Departments being Rs. 10,579 and Rs. 31,495 respectively, the total charge against revenue being Rs. 93,774 against Rs. 90,711 of the previous year. The percentage of expenditure on revenue was 29·80 and the cost of maintenance per acre 0·87.

Wáhurwáh.

42. The Wahurwáh as usual did not work well. The river is still encroaching on it and it is not desirable to expend any money to remedy its present state until the river changes its course. The area irrigated on this canal was 7,100 acres under both kharif and rabi, and a net assessed revenue of Rs. 17,137 against an area of 9,677 acres and a net assessed revenue of Rs. 24,819 of the previous year. The remission granted during the year was Rs. 2,908. The expenditure on maintenance and repairs was Rs. 2,433 and Rs. 3,077 on account of establishment charges in the Public Works and Revenue Departments. Total charge against revenue Rs. 5,510.

Márui.

43. The result on the Máruiwáh is not favourable either as the encroachments of the river at its mouth caused it to work badly. The area irrigated on this canal was 3,446 acres under both kharif and rabi yielding a net assessed revenue of Rs. 10,056 against an area of 3,678 acres and a net assessed revenue of Rs. 11,374 of the previous year. Remission Rs. 26. Expenditure on maintenance and repairs Rs. 1,599, or including establishment charges in both the departments, a total charge against revenue of Rs. 1,926.

Right bank bunds.

44. It may be mentioned about the Right bank bunds that the only place along the whole line which caused some anxiety was the loop line between 3½ and 5½ miles Jhali embankment. Here the water rose to within 1′ 9″ of top of embankment, and as there was 9′ depth of water against it and the river was then 2′ 2″ lower than last year, and as a greater height was expected in August, which is usually the months for maximum flood, this length was raised to a height of 3 feet above the height the water stood on the 22nd July, a needless precaution as subsequent events proved. As before stated the river eroded seriously near the mouth of the Fordwáh, but did not necessitate a loop being constructed to the Jhali bund, though one was laid out in anticipation; and this had to be made subsequently.

THAR AND PA'RKAR.

Eastern Nára Canals.

45. The result of the season's operation in the Eastern Nára districts is satisfactory, as though the inundation was unfavourable elsewhere it does not appear to have affected the canals here, as will be seen from the following figures for the whole of the Eastern Nára works for the year under review and for the three previous ones :—

Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1880-81	55,376	44,365	99,741	1,11,248	83,867	1,95,115	2·01	1·89	1·96
1881-82	69,002	18,869	87,871	1,43,471	30,965	1,74,436	2·08	1·64	2·00
1882-83	59,389	15,948	75,337	1,09,281	25,946	1,35,227	1·84	1·64	1·79
1883-84	67,161	25,421	92,582	1,40,233	41,612	1,81,845	2·09	1·64	1·96

Comparing the year's yield with that of the previous one the result is an increase in the area cultivated under kharif and rabi respectively of 7,772 and 9,473 acres, or a total increased cultivation of 17,245 acres, and an increase in the net assessed revenue of Rs. 30,952 for the kharif and Rs. 15,666 for the rabi, or a total increase of Rs. 46,618, a very satisfactory result indeed, showing an improvement on two years but still a falling off from 1881-82. The expenditure on maintenance and repairs was Rs. 45,947, the cost of establishment and revenue collection charges were Rs. 13,077 and Rs. 17,737 respectively, making the total revenue expenditure Rs. 76,761. The percentage of expenditure on revenue was 41·36 and the cost of maintenance per acre 0·82. The net revenue for the year is Rs. 1,03,503, but deducting interest charges Rs. 1,56,373 there is a net deficit for the year of Rs. 52,870.

Mithrau Canal.

46. The Mithrau Canal was opened on the 10th May. The cultivators utilized the water without delay. Though the river Indus was low the supply was ample, and there were no complaints and no breaches. In fact the canal and its branches worked in a very satisfactory manner throughout the season. The result of the year's operations with those of the past 3 years is given below :—

Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1880-81	50,292	22,357	72,649	1,01,421	33,875	1,35,296	2·01	1·51	1·86
1881-82	58,991	8,568	67,559	1,20,587	13,821	1,34,408	2·04	1·61	1·99
1882-83	49,825	7,168	56,993	91,094	11,602	1,02,696	1·83	1·62	1·82
1883-84	61,770	13,199	64,969	1,06,967	20,269	1,27,236	2·07	1·54	1·96

The result on this canal for the year under review as compared with the previous one is an increased area under both kharif and rabi of 1,945 and 6,031 acres, or a total of 7,976 acres, and the increase in the net assessed revenue is Rs. 15,873 for kharif and Rs. 8,667 for rabi, or a total increase of Rs. 24,540. The reasons for this increase is due apparently to the following causes. First, that 31 miles of the Protective embankment were completed in time to give confidence to the Zamindárs on the upper portion of the canal where they utilized land never before brought under cultivation ; this improvement is likely to continue. Secondly, there was more water in the Indus during January and February 1883 than during the same months of the previous year : this enabled the men to water and soften the land for the plough, giving them time to have all in readiness for the seed when the proper time arrived. Lastly, there was less rain than in the previous year, the average fall at Khipra for 1882 being 8 inches and 83 cents and for 1883 4 inches and 94 cents, and consequently less grass, which gives less labour in clearing the ground for the crops.

47. The expenditure on maintenance and repairs was Rs. 19,940 and the cost of establishment and revenue collection was Rs. 5,750 and Rs. 11,441, the total charges against revenue being Rs. 37,131. The percentage of expenditure on revenue was 32·18 and the cost of maintenance per acre 0·57. The average discharge of the canal during the kharif season was 911 cubic feet per second, and the duty 56·85 acres to the cubic foot.

Thar Canal.

48. The Thar Canal was opened on the 1st of June and water was sufficient for all requirements. This desirable result is due to the opening up of part of the Makhi weir and to the closing of the entrance to the Kalankar dhand. The result on this canal is satisfactory as will be seen from the following figures :—

Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1880-81	1,041	4,151	5,192	1,916	6,088	8,004	1·84	1·47	1·54
1881-82	4,832	4,467	9,299	10,553	6,597	17,150	2·18	1·47	1·84
1882-83	7,286	1,864	9,150	15,502	2,398	17,900	2·13	1·28	1·95
1883-84	13,003	3,056	16,059	28,749	4,241	32,990	2·21	1·38	2 05

Compared with the returns for the previous year the result is an increase in the area under both kharif and rabi of 5,717 and 1,192 acres respectively, or a total of 6,909 acres; and the increase therefore in the net assessed revenue is Rs. 13,247 and Rs. 1,843, or a total increase of Rs. 15,090. The increase is due partly to the early supply of water and partly to the Protective embankment having been closed in for the whole length, though not to its full height, still high enough to prevent the greatest known flood from overtopping it. The expenditure on maintenance and repairs was Rs. 10,198, and establishment and revenue collection charges Rs. 2,947 and Rs. 3,005: total charge against revenue Rs. 16,150. The percentage of expenditure on revenue was 53·47 and the cost of maintenance per acre 0·97. No discharges were taken.

49. The area irrigated on the Dimwáh was 976 acres of kharif and 300 acres of rabi, the net assessed revenue for both being Rs. 2,113, against 919 acres of kharif and 211 acres of rabi, and a net assessed revenue of Rs. 2,390 of the previous year. The area irrigated on the Heranwáh under both kharif and rabi was 255 acres, which produced a net assessed revenue of Rs. 359, against an area of 136 acres and a net assessed revenue of Rs. 277 of the previous year. The cost of maintenance and repairs, and establishment and revenue collection charges for both the canals were Rs. 1,345. The percentage of expenditure on revenue and the cost of maintenance per acre on the Dimwáh was 67·12 and 1·00 and on the Heranwáh 21·36 and 0·30.

HYDERABAD COLLECTORATE.

Hyderabad Canals.

50. The inundation was as unfavourable for the canals in this district as it was favourable in the previous year; for although the canals were opened between the 15th and 20th of June, very little water entered them which was of any use to the cultivators until the 5th July, and no water entered the Renwáh before that date. The supply in June was not only late, but when at its best was on average 3 feet below those of the past 2 seasons. When the river rose in July the dhands which feed the Great Márak and all the canals southward commenced to flow and there was then nothing to complain of in the entire Hála Táluka: but the canals in the Naushahro Táluka in the north failed in their water-supply except the Mehrabwáh and Navlákhi. The Mehrabwáh new head was not opened until the 22nd of June when 4 feet of water entered the canal. On the same date there was 5·10 feet in the Navlákhi. The Mehrabwáh worked in a satisfactory manner, although unfortunately the river fell on the day after the canal was opened and did not commence to rise again until the 5th July. Throughout July the supply was good and in August fair; and on the 8th of September and up to

the 11th it was good and sufficient, except quite at the tail where there were some complaints. The Navlakhi was fed entirely from its southern head during the past season. It takes out of the dhand which had not filled properly for 4 or 5 years previously, owing to the river having thrown up a large sand-bank opposite the channel which feeds it. The sand-bank having been carried away during the inundation of 1882 the canal was fed from the dhand, and although the supply from the river into the dhand failed two or three times during the season owing to the fluctuations of the river, the dhand, which is very large and capable of containing 8 or 10 days' full supply for the canal, kept the water up to almost a full height during the whole season. There has been no failure of crops on this canal although much of the cultivation depends on "Moke" or irrigation by direct flow without use of wheels. The river opposite the heads of the Dambro and Dadwáhs considerably shifted its course during the inundation which caused much silt to be thrown into the dhands which feed these canals. The Renwáh has been supplied through its lower head for some years from a large Wahur: but as the channel from the river in the Wahur had partly closed, a new cut was made. This cut silted heavily, and in the drop of the river at the end of June another cut had to be made: this cut threw a good supply into the canal up to the end of July, but again on the fall of the river the supply failed. The other canals of this district not mentioned above suffered also more or less from the ill effects of the inundation. The results for the year and for the past 3 years are given below:—

Years.	Cultivation.			Net Consolidated Revenue.			Rate per Acre.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1880-81	241,686	8,356	250,042	5,91,916	20,164	6,12,080	2·45	2·41	2·45
1881-82	259,899	17,188	277,087	6,18,970	19,254	6,38,224	2·38	1·12	2·30
1882-83	262,135	30,015	292,150	5,56,760	80,502	6,37,262	2·12	2·68	2·18
1883-84	257,155	8,562	265,717	5,67,794	22,092	5,89,886	2·21	2·58	2·22

Compared with the previous year there is in the year under report a decrease of 26,433 acres of cultivation and of Rs. 47,376 of net consolidated revenue, and need it be said that this unsatisfactory result is due to the unfavourable nature of the inundation.

51. Of the four canals in this district for which Capital and Revenue Accounts are kept, namely, the Mehrabwáh, Alibahr Kachheri, Great Márak and Sarfrazwáh, the first produced a net revenue of Rs. 2,005, the second a deficit of Rs. 730, the third and fourth a net revenue each of Rs. 37,170 and Rs. 4,623. Taking the canals collectively the expenditure on maintenance and repairs was Rs. 1,55,202, the cost of establishment and revenue collection charges were Rs. 42,784 and Rs. 47,822, and the total charges against revenue were Rs. 2,45,808. The percentage of expenditure on revenue was 44·85 and the cost of maintenance per acre 0·81. The discharges for a few of the canals are given in Table VIII.

Fuleli Canals.

52. Although the general result shows improvement, yet the low inundation was unfavourable for cultivation on high lands and on the small high level canals leading directly from the river in this district, some of which ran completely dry at a critical time for irrigation. Everything that was possible was done to mitigate the damage to the crops by arranging to supply the various irrigating channels in succession: but the benefit from this was but small. The want of water was most felt from 22nd June to 4th July and from 23rd August to end of the season. The táluka that suffered most was the Guni. In Badin and Bágo Tándo Tálukas, where there is usually too much water, there was comparatively little damage done, and the lands in Hyderabad and Dehro Mohbat Tálukas being mainly irrigated by wheel did not suffer much. The figures for the year under review and those for the past 3 years are given below:—

	Years.	Cultivation.			Net Consolidated Revenue.			Rate per Acre.		
		Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
		Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Fuleli.	1880-81	154,533	4,367	158,900	3,55,088	9,959	3,65,047	2·30	2·28	2·30
	1881-82	166,037	7,209	173,246	3,71,935	10,751	3,82,686	2·24	1·49	2·21
	1882-83	144,418	10,363	155,281	3,36,099	10,866	3,46,965	2·33	1·00	2·23
	1883-84	156,645	5,668	162,313	3,83,536	10,997	3,94,533	2·45	1·94	2·43
Other Canals.	1880-81	14,764	395	15,159	34,418	743	35,161	2·33	1·88	2·32
	1881-82	14,619	424	15,043	35,865	918	36,783	2·45	2·16	2·44
	1882-83	15,754	1,067	16,821	34,276	1,061	35,337	2·17	1·00	2·10
	1883-84	16,341	323	16,664	47,962	1,937	49,899	2·93	5·99	2·99

Compared with the figures for the previous year the results are: 1st, as to Fuleli—there is an increase of 7,032 acres of cultivation and Rs. 47,568 of net consolidated revenue. Next as to "other canals"—there is a decrease of 157 acres of cultivation and an increase of Rs. 14,562 of net consolidated revenue. The net increased area of cultivation is 6,875 acres as will be seen from the following:—

	Increase.	Decrease.
	Acres.	Acres.
Hyderabad	...	2,459
Tando Alahyar	57	...
Guni	8,125	...
Dehro Mohbat	...	70
Bágo Tando	...	881
Badin	1,784	...
Thar and Párkar	319	...

Net Increase 6,875 Acres.

53. The decrease in Hyderabad is probably due to relinquished numbers which have been thrown up on account of the approaching new settlement. The remission on account of water was very small, only Rs. 90, most of the land being irrigated by wheel which a low inundation scarcely affects. Tando Alahyar and Dehro Mohbat call for no remarks. The increase in Guni is due simply to more accurate record, as 1883-84 was the first year of settlement. The increase in the Thar and Párkar districts from lands watered by the tail branches of the Fuleli is due to rabi cultivation, as the Nasirwáh Jhuda being used as an escape has a good supply during the cold weather. The decrease in Bágo Tándo is due to diminished area of rabi cultivation. The increase in Badin is due partly to absence of flooding and partly to more extended cultivation on the Sher Sanhiro and Sanhi Guni. The increase of revenue of Rs. 62,130 under both the Fuleli and "other canals" is accounted for as follows:—

	Increase.	Decrease.
	Rs.	Rs.
Hyderabad	...	737
Tando Alahyar	189	...
Guni	54,170	...
Dehro Mohbat	2,048	...
Bágo Tando	495	...
Badin	6,170	...
Thar and Párkar	...	205
	63,072	942

Net Increase Rs. 62,130.

54. The increase of course is due to causes mentioned above; but it may be stated the increase of revenue of Rs. 54,170 in the Guni Táluka is due entirely to the introduction of the new settlement. It is believed that certain suspensions of revenue have been recommended for this táluka, some of which may eventually

be sanctioned as remissions which will still further reduce the increase. Roughly speaking, the assessment in the Guni Táluka may be said to have increased 50 per cent. by the introduction of the temporary settlement, and if the settlement is maintained and the resettlement of the other tálukas result in similar increases, the Fuleli will prove one of the best paying canals in the Province.

55. Taking all the canals in the district together the total cost of maintenance and repairs was Rs. 1,26,476 and the total revenue expenditure, including Rs. 35,161 for establishment and Rs. 19,621 for revenue collection, was Rs. 1,81,258 : the percentage of expenditure on revenue was 43·02 and cost of maintenance per acre 0·84. The average discharge for the Fuleli is entered in Table VIII. The figures representing area cultivated can be considered approximate only, as in the unsettled tálukas where leases are in force they are really only guess work, and are probably under-estimated. For instance, the settlement department after careful study of the records estimated the area irrigated in the Guni Táluka at 41,666 acres, from which 1,500 acres should be deducted on account of rabi, leaving, say, 40,000 acres as kharif, while in 1883-84, the first year of the settlement when more accurate figures were available, the area irrigated by the Fuleli is returned as 32,541 acres to which must be added the area irrigated by "Other canals," namely, 16,341 acres, making in all 48,882 acres.

KARA'CHI COLLECTORATE.

Karáchi Canals.

56. The lowness of the inundation appears to have affected the canals in this district, both large and small, to a rather serious extent, as there is a considerable decrease in the area cultivated as compared with the previous year, and as will be seen from the following table :—

Years.	Cultivation.			Consolidated Assessment.			Remission.			Net assessed Revenue.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1882-83	185,935	61,852	247,787	4,53,677	1,49,117	6,02,794	1,00,291	6,214	1,06,505	4,96,289
1883-84	175,384	35,851	211,235	4,67,053	1,06,162	5,73,215	58,640	2,981	61,621	5,11,594
Difference	−10,551	−26,001	−36,552	+13,376	−42,955	−29,579	−41,651	−3,233	−44,884	+15,305

57. The results recorded above speak for themselves, and it seems hardly necessary therefore to enter into details as to the decrease in the area irrigated during the year, especially when the causes which led to it are so well known. The net consolidated assessments show certainly an increase of Rs. 15,305 ; but the remissions for the year of report amount to less by Rs. 44,984 than in the previous one, and it may be remarked that had it not been for the increased assessments in the Jerruck and Shahbandar districts the decrease in the consolidated revenue would have been serious.

58. The canals in the Sehwan district were generally in fair order, and with a favourable inundation afford a sufficient supply for all cultivation on them. The exceptions are the Kur Akatar, a branch of the Nára, and the Upper Nurwáh. The Kur Akatar running across the natural drainage of the country has been a good deal damaged by water from flood and breaches passing over it ; but it has since been put into thorough order in readiness for the inundation of 1884. The Upper Nurwáh has only lately been taken over from the Zamindárs and is being gradually got into order, and will be working up to its full power in a few seasons when all the land on it will have quite recovered from the effects of a succession of floods from the Sir. A new sluice has been built to regulate the supply at the tail. The Nára, the principal feeder in this district, is working well and with the exception of the extension of its embankments in the upper reaches, which is gradually being carried out, requires nothing. This is almost the only canal in the district in which there was a full and sufficient supply during the season ; but this was only obtained by careful regulation by the system of sluices with which it is supplied. In the Jerruck district also the canals are in fair order except unfortunately the Baghar, which is the principal canal, and

its branches. This canal has for years been deteriorating on account of the unfavourable action of the river at its mouth; but it is satisfactory to be able to state that the river is fast approaching such a position as will admit of a new mouth or feeder being dug, which it is hoped will in a great measure restore its former prosperity. It also has suffered from the influx of sea water in the lower reaches; but it is confidently hoped that this will be greatly retarded, if not stopped, when the new mouth has been got to work satisfactorily. The greater part of this district is subject to heavy floods from the river, and the bunds along the whole right bank are gradually being strengthened and prolonged, so that in 2 years it is hoped that the whole district will be fully protected. This work cannot be done all at once or in a hurry, as it is necessary to watch carefully the course of the river and get a tolerably fair idea of what is probable at different places before deciding on the best position for a bund or even on the necessity for one. In the Shahbandar districts the canals in the Shahbandar Táluka are the only ones that are not in tolerably good condition, and these for some years have not had their fair share of allotments principally owing to the impossibility of spending much money out of an inadequate grant on works that barely re-pay the outlay. They are however being put into order this year, 1884-85, as are also most of the canals in this district which suffered considerably from the fluctuations of the river during the inundation. The working of the Pinyari, the largest and most important canal in this district, cannot be said to be very satisfactory. The slope of the country is such that to secure the cultivation in the upper portion it is necessary to let down more water than the canal can carry on its lower reaches. As long as the cultivators in the upper portion must have "flow," there is no remedy for this but the construction of a system of regulating sluices and opening out all possible escapes for the surplus water: both these works are being pushed forward. The line of river embankments stood well. When the work is completed it ought to give complete security to the whole district. It may however be found necessary to extend the line some 10 or 12 miles south of its present end to protect some of the southern dehs of the Shahbandar Táluka; but it is advisable to wait till the river has shewn some decided symptoms of settling at least for some time down one or other of the branches into which it separates just below the village of Kadernashah where the line ends at present.

59. The expenditure incurred on maintenance and repairs on the canals and bunds in this executive charge was Rs. 1,92,788 and Rs. 47,701 for establishment and Rs. 47,543 for revenue collection, or a total charge against revenue of Rs. 2,88,030. The percentage of expenditure on revenue was 60·78 and cost of maintenance per acre 1·26.

J. E. WHITING, M.A., M.INST.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

Superintending Engineer's Office,
Camp Mádeji, 4th February 1885.

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY.

No. 666 OF 1885.

PUBLIC WORKS DEPARTMENT,

COMMISSIONER'S OFFICE,

Camp Tando Ádam, 20th February 1885.

Superintending Engineer's No. 325, dated the 4th February 1885, forwarding the Irrigation Report.

Submitted to Government.

2. The inundation was not a good one, "its fluctuating nature being its chief and worst characteristic." The canals, in consequence of the lowness of the inundation, were not well filled, the result being that cultivation was contracted and collections were also affected. Remissions also had to be granted to a considerable extent. One result of the lowness of the inundation was that the protective embankments were not greatly tried and breaches and floods were rare.

3. There was a decrease in kharif cultivation amounting to 84,178 acres and in rabi of 62,007 acres, total 146,185 acres, but the canal revenue for collection was only less than that of the previous year by Rs. 31,792, a result mainly attributable to higher rates on lands which owing to improvements in canals have been converted into rice lands instead of being classed only as fit for dry crops.

4. The amount of remissions (para. 12 of the report) does not correctly represent the losses on the year's cultivation, as unfortunately, especially in the Hyderabad District, the Collector failed to dispose of remission claims within the year, and after the close of the year claims amounting to Rs. 83,093 were admitted, namely, in Hyderabad Rs. 66,762, in Shikárpur, 15,749, and in the Frontier District Rs. 581. These remissions, however, are not solely on account of lands watered from canals, so the exact sum admitted against canal revenue cannot be stated.

5. The table in para. 5 of the report shows the increase or decrease in each Canal Division—the largest increase is in the Fuleli Division—but the greater part of the increase thus shown has since been remitted. The Superintending Engineer has fully explained the causes of increase or decrease in the other Divisions and they call for no remark. It is unnecessary for the Commissioner to follow the Superintending Engineer in his account of the different canals. All details have been very fully given. Suffice it to say that the financial results (para. 19) are satisfactory.

6. The work of recent years done by the Irrigation Department has been productive of great good, but the full return from the work done cannot be expected at once, especially in a country like Sind where agricultural labourers are not easily obtained. The revenue realizations of the year to which the report refers, though less than those of the previous year, yet illustrate how much has been done, as with a low inundation the revenue would have shown a much larger decrease but for recent improvements to canals. Land too in the rear of the protective embankments is now being fast got ready for cultivation, and the Commissioner will be very much surprised if in the course of a few years there is not a large and steady increase in realizations. He has only recently travelled along the Thar and also the Nára protective embankments and was struck with the change in the country since he saw it three years ago. Everywhere lands were being got ready for the plough, and what was very satisfactory to notice was that the pople were much better off than formerly. Before the erection of the protective embankments cultivation was risky, one year splendid returns, the next sad losses, and this condition of things affected the morale of the people. Now with protection from floods they are becoming steady cultivators, working harder, and more anxious for improvements; and what is true of the Nára valley is, the Commissioner believes, true of every part of Sind, and that the protective embankments, if properly maintained, will do much to improve the condition and raise the character of the agricultural population. Much still remains to be done, but the results of the year as shown in this report show that satisfactory progress is being made.

H. N. B. ERSKINE,

Commissioner in Sind.

TABLE I.

Cultivation and Water-share of Net Consolidated Revenue for 1883-84 *and three previous years.*

Executive Charges.		1880-81.		1881-82.		1882-83.		Average.		1883-84.	
		Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
Begári Canals	Desert Canal	59,227	96,620	62,645	1,04,174	71,869	1,18,901	64,580	1,06,565	55,490	96,341
	Begári Canal	49,935	91,143	75,823	1,32,180	103,532	1,87,985	76,430	1,37,103	105,302	1,95,030
	Kashmor Bund	....	....	....	....	645	1,144	215	381	2,122	3,804
Shikárpur Canals	Canals in Rohri	36,040	87,043	46,232	1,06,134	51,348	1,08,472	44,540	1,00,550	43,691	1,02,392
	Bunds in Rohri	3,400	7,340	3,540	7,280	3,821	7,224	3,587	7,281	2,305	5,209
	Sind Canal	44,429	1,05,289	47,919	1,24,521	49,957	1,15,266	47,435	1,15,025	41,184	1,01,464
	Sukkur-Begári Bund	....	....	....	....	....	....	....	....	....	....
Ghár Canals	Sukkur Canal	58,821	99,319	66,304	1,08,583	73,283	1,53,981	66,136	1,20,628	59,630	1,38,145
	Ghár	216,444	4,62,986	208,266	5,65,260	230,285	6,52,215	218,325	5,60,153	194,785	6,39,430
	Nára	82,967	2,40,456	126,643	3,85 043	122,809	3,38,273	110,806	3,21,257	98,518	3,06,992
	Wáhur	7,544	24,013	7,823	20,535	9,677	22,337	8,348	22,295	7,160	15,423
	Márui	4,061	11,733	3,887	12,031	3,698	10,237	3,882	11,334	3,446	9,051
	Bunds, Right Bank	756	1,792	93	180	12	41	287	671	23	95
Eastern Nára Canals.	Nára Supply Channel	283	831	278	768	62	138	208	579	398	1,027
	Eastern Nára	20,934	44,608	9,873	18,232	7,866	10,630	12,891	24,490	9,655	16,205
	Mithrau Canal	72,649	1,21,706	67,559	1,19,260	56,993	92,426	65,734	1,11,151	64,969	1,14,513
	Thar Canal	5,192	7,204	9,299	15,435	9,150	16,110	7,880	12,916	16,059	29,691
	Dimwáh	676	1,183	821	1,513	1,130	2,151	876	1,616	1,276	1,901
	Heranwáh	7	12	41	78	136	249	61	113	225	323
Hyderabad Canals.	Mehrabwáh	9,247	18,971	8,095	15,393	11,644	18,765	9,662	17,710	9,631	19,052
	Nasrat	7,709	30,956	12,776	37,766	22,651	44,929	14,378	37,884	11,046	29,003
	Navlakhi	33,065	78,277	34,305	84,887	40,171	94,377	35,847	85,847	38,452	88,028
	Dambro	6,084	15,799	5,852	13,216	5,627	13,679	5,854	14,231	5,303	12,392
	Dád	14,662	41,046	18,522	42,575	19,245	40,768	17,476	41,468	17,147	37,023
	Rein	11,092	25,802	10,218	21,156	10,339	21,603	10,548	22,854	9,871	21,941
	Alibahr Kacheri	6,819	13,992	8,112	17,292	7,835	15,264	7,588	15,516	7,085	14,164
	Márak	39,907	91,104	43,010	1,01,152	41,084	91,514	41,338	94,590	39,154	86,269
	Gharo Mahmuda	39,222	84,579	42,778	87,189	41,681	79,947	41,227	83,905	42,302	77,704
	Kari Shumáli	23,856	39,423	27,683	42,892	27,942	38,087	26,497	40,334	28,298	37,981
	Nasir	23,030	40,338	25,972	41,009	25,021	40,347	24,974	40,585	23,041	40,604
	Sarfráz	17,805	25,550	20,681	26,006	17,704	24,824	18,723	25,460	16,698	25,095
	Other Canals	16,644	45,035	19,108	43,869	21,206	48,832	18,988	45,912	17,689	41,642
Fuleli Canals	Fuleli	158,000	3,28,542	173,246	3,44,417	155,281	3,12,269	162,476	3,28,409	162,313	3,55,058
	Other Canals	15,159	31,645	15,043	33,105	16,821	31,803	15,674	32,184	16,664	44,909
Karáchi Canals	Nára	82,232	1,68,454	56,487	1,92,229	72,353	1,48,245	70,357	1,69,642	64,190	1,45,333
	Phitta	11,423	19,175	5,534	26,773	5,912	13,730	7,623	19,893	4,746	9,048
	Canals north of Kotri	12,407	23,901	10,121	26,456	13,877	28,903	12,135	26,420	10,550	20,521
	Kalri	8,504	21,316	8,331	21,499	9,728	19,054	8,854	20,623	5,827	13,790
	Baghár	10,739	25,513	12,601	28,072	15,971	30,516	13,104	28,034	11,908	21,109
	Uchita	15,735	39,004	13,812	31,804	12,315	29,643	13,954	33,483	9,573	21,372
	Canals in Tatta, &c.	6,818	15,573	7,425	15,998	8,234	12,515	7,491	14,695	5,724	11,406
	Shal Canals	....	....	....	....	....	....	....	....	1,023	1,639
	Pinyári	49,800	1,18,783	52,525	1,07,276	54,268	77,812	52,198	99,624	51,331	1,21,790
	Canals in Mirpur Batoro	9,403	20,598	9,738	20,454	9,694	15,651	9,612	18,901	9,485	23,007
	Canals in Sujáwal	5,563	12,430	5,796	12,029	10,738	8,808	7,365	11,089	6,648	15,503
	Satta	5,942	16,731	7,432	18,136	8,425	16,621	7,266	17,163	6,638	17,265
	Canals in Jati	1,369	4,302	1,591	4,095	1,725	3,222	1,562	3,893	1,202	4,046
	Khánta	4,745	11,149	6,162	11,788	6,393	9,761	5,767	10,899	5,957	8,621
	Kokowari	13,941	30,544	15,999	32,814	15,138	26,120	15,026	29,826	14,145	21,152
	Canals in Sháhbandar	1,960	4,362	2,203	4,628	2,471	4,482	2,211	4,491	1,870	3,481
	Bunds, Left Bank	620	1,775	750	1,765	458	1,445	609	1,662	418	1,352
	Bunds, Right Bank	....	....	....	....	87	132	29	44	....	....
Begári Canals		109,162	1,87,763	138,468	2,36,354	176,046	3,08,030	141,225	2,44,049	102,914	2,95,175
Shikárpur Canals		83,869	1,99,672	97,691	2,37,935	105,126	2,30,962	95,562	2,22,856	87,180	2,09,065
Ghár Canals		370,593	8,40,200	418,016	10,91,632	439,744	11,77,084	407,784	10,86,338	363,502	11,09,136
Eastern Nára Canals		99,741	1,75,604	87,871	1,55,286	75,337	1,21,704	87,650	1,50,805	92,582	1,63,660
Hyderabad Canals		250,042	5,50,872	277,087	5,74,402	292,150	5,78,536	278,093	5,66,271	265,717	5,30,893
Fuleli Canals		174,059	3,60,187	184,289	3,77,522	172,102	3,44,072	178,150	3,60,593	178,977	3,99,989
Karáchi Canals		241,196	5,28,670	216,507	5,55,816	247,787	4,46,660	235,163	5,10,382	211,235	4,60,435
	Total	1,328,662	28,43,067	1,418,929	32,28,947	1,508,292	32,02,048	1,418,627	30,91,354	1,362,107	31,68,358

TABLE II.

Area of Cultivation and Canal Revenue for 1883-84 *and five previous years.*

Years.	Cultivation.			Water-share of Net Consolidated Revenue.	Hakaba.	Miscellaneous.	Total Canal Revenue.
	Government.	Jághir.	Total.				
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1878-79	1,885,315	130,774	2,016,089	29,57,160	35,753	47,521	30,40,434
1879-80	1,342,753	111,275	1,454,028	27,72,085	41,075	39,547	28,53,207
1880-81	1,328,662	164,007	1,492,669	28,43,067	41,722	59,243	29,44,032
1881-82	1,418,929	183,057	1,601,986	32,28,947	74,828	41,966	33,45,741
1822-83	1,508,292	165,001	1,673,293	32,02,048	87,057	49,739	33,38,844
Average	1,496,790	150,823	1,647,613	30,00,661	56,187	47,603	31,04,451
1883-84	1,362,107	178,724	1,540,831	31,68,358	85,134	53,560	33,07,052
Increase or Decrease	—134,683	+27,901	—106,782	+1,67,697	+28,947	+5,957	+2,02,601

J. E. WHITING, M.INST.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE III.

Area of Cultivation and Canal Revenue for 1883-84.

Collectorates and Canals.			Cultivation.			Water-share of Net Consolidated Revenue as in Table VII.	Hakaba.	Miscellaneous.	Total Canal Revenue.
			Government.	Jághír.	Total.				
			Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Frontier, Upper Sind.	Begári Canals	Desert Canal	55,490	29,033	84,523	96,341	15,001	185	1,11,527
		Begári Canal	105,302	40,741	146,043	1,95,030	29,822	1,348	2,26,200
		Works for which no Capital or Revenue Accounts are kept	2,122	...	2,122	3,804	...	422	4,226
Shikárpur	Shikárpur Canals	Canals in Rohri	43,691	674	44,365	1,02,392	297	1,306	1,03,995
		Bunds in Rohri	2,305	...	2,305	5,209	...	5	5,214
		Sind Canal	41,184	1,788	42,972	1,01,464	1,206	260	1,02,930
		Sukkur-Begári Bund	...	...	...	.....	...	105	105
		Works for which no Capital or Revenue Accounts are kept	...	...	...	.....	...	26	26
	Ghár Canals	Sukkur Canal	59,630	492	60,122	1,38,145	237	519	1,38,901
		Ghár	194,785	4,656	199,441	6,39,430	1,468	3,552	6,44,450
		Nára	98,518	9,047	107,565	3,06,992	2,034	5,599	3,14,625
		Wáhur	7,100	...	7,100	15,423	...	1,280	16,703
		Márui	3,446	...	3,446	9,051	...	...	9,051
		Bunds, Right Bank	23	...	23	95	...	58	153
		Works for which no Capital or Revenue Accounts are kept	...	...	...	.....	...	70	70
Thar and Párkar.	Eastern Nára Canals.	Nára Supply Channel	398	...	398	1,027	...	3,449	4,476
		Eastern Nára	9,655	...	9,655	16,205	...	17,107	33,312
		Mithrau Canal	64,969	...	64,969	1,14,513	...	867	1,15,380
		Thar Canal	16,059	647	16,706	29,691	361	152	30,204
		Dimwáh	1,276	...	1,276	1,901	...	...	1,901
		Heranwáh	225	...	225	323	...	...	323
		Works for which no Capital or Revenue Accounts are kept	...	...	...	.....	...	...	.....
Hyderabad	Hyderabad Canals	Mehrabwáh	9,631	6	9,637	19,052	...	263	19,315
		Nasrat	11,046	313	11,359	29,003	337	179	29,519
		Navlákhi	38,452	1,897	40,349	88,028	1,121	202	89,351
		Dambro	5,303	237	5,540	12,392	180	...	12,572
		Dad	17,147	3,742	20,889	37,023	1,682	401	39,106
		Rein	9,871	25	9,896	21,941	13	42	21,996
		Alibahr Kacheri	7,085	753	7,838	14,164	355	39	14,558
		Márak	39,154	5,683	44,837	86,269	1,472	122	87,863
		Gháro Mahmuda	42,302	10,151	52,453	77,704	4,068	514	82,286
		Kari Shumáli	28,298	7 647	35,945	37,981	2,534	444	40,959
		Nasir	23,041	1,292	24,333	40,604	584	268	41,456
		Sarfraz	16,698	3,290	19,988	25,095	916	287	26,298
		Other Canals	17,689	1,642	19,331	41,642	900	239	42,781
		Works for which no Capital or Revenue Accounts are kept	...	...	...	.....	..	...	.....
	Fuleli Canals	Fuleli	162,313	35,634	197,947	3,55,080	15,045	5,027	3,75,152
		Other Canals	16,664	1,974	18,638	44,909	798	465	46,172
		Works for which no Capital or Revenue Accounts are kept	...	...	...	.....	...	...	.....
Karáchi	Karáchi Canals	Nára	64,190	9,668	73,858	1,45,333	1,932	4,143	1,51,408
		Phitta	4,746	752	5,498	9,048	239	283	9,570
		Canals north of Kotri	10,550	1,716	12,266	20,521	332	53	20,906
		Kalri	5,827	401	6,228	13,790	135	523	14,448
		Baghar	11,908	1,247	13,155	21,109	474	349	21,932
		Uchita	9,573	...	9,573	21,372	...	111	21,483
		Canals in Tatta, &c.	5,724	740	6,464	11,406	420	231	12,057
		Shal Canal	1,023	...	1,023	1,639	...	..	1,639
		Pinyari	51,331	1,157	52,488	1,21,790	595	2,372	1,24,757
		Canals in Mirpur Batoro	9,485	...	9,485	23,007	...	...	23,007
		Canals in Sujáwal	6,648	318	6,966	15,503	10	5	15,518
		Satta	6,638	209	6,847	17,265	123	8	17,396
		Canals in Jati	1,202	248	1,450	4,046	50	...	4,096
		Khanta	5,957	202	6,159	8,621	72	11	8,704
		Kokawari	14,145	...	14,145	21,152	...	137	21,289
		Canals in Shahbandar	1,870	159	2,029	3,481	40	510	4,031
		Bunds, Left Bank	418	303	721	1,352	114	...	1,466
		Bunds, Right Bank	...	240	240	.....	167	...	167
		Works for which no Capital or Revenue Accounts are kept	...	...	...	.....	...	22	22
Begári Canals			162,914	69,774	232,688	2,95,175	44,823	1,955	3,41,953
Shikárpur Canals			87,180	2,462	89,642	2,09,065	1,503	1,702	2,12,270
Ghár Canals			363,502	14,195	377,697	11,09,136	3,739	11,078	11,23,953
Eastern Nára Canals			92,582	647	93,229	1,63,660	361	21,575	1,85,596
Hyderabad Canals			265,717	36,678	302,395	5,30,898	14,162	3,000	5,48,060
Fuleli Canals			178,977	37,608	216,585	3,99,989	15,843	5,492	4,21,324
Karáchi Canals			211,235	17,360	228,595	4,60,435	4,703	8,758	4,73,896
		Total	1,362,107	178,724	1,540,831	31,68,358	85,134	53,560	33,07,052

J. E. WHITING, M.INST.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE IV.

Revenue Expenditure on New Works, Maintenance and Repairs, and Revenue Charges in Civil Department for 1883-84.

Canals and Divisions.		Revenue Expenditure.								Total Revenue Expenditure.			
		Improvements.			Maintenance and Repairs.			Revenue Charges in Civil Department.	Total.	Works.	Establishment.		Total.
		Works.	Establishment.	Total.	Works.	Establishment.	Total.				Public Works Department.	Civil Department.	
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals.	Desert Canal	..	..	..	14,745	5,659	20,404	9,483	29,887	14,745	5,659	9,483	29,887
	Begári Canal	..	..	..	42,164	13,329	55,493	17,084	72,577	42,164	13,329	17,084	72,577
	Kashmor Bund	20,394	4,294	24,688	47,858	10,078	57,936	380	58,316	63,252	14,372	380	83,004
Shikárpur Canals.	Canals in Rohri	..	..	..	34,281	5,195	39,476	10,250	49,726	34,281	5,195	10,250	49,726
	Bunds in Rohri	..	..	..	7,641	1,158	8,799	520	9,319	7,641	1,158	520	9,319
	Sind Canal	..	..	..	15,225	2,307	17,532	10,551	28,083	15,225	2,307	10,551	28,083
	Sukkur-Begári Bund	43,609	6,609	50,218	20,548	3,114	23,662	..	23,662	64,157	9,723	..	73,880
Ghár Canals.	Sukkur Canal	..	..	..	21,400	4,039	25,439	6,666	32,105	21,400	4,039	6,666	32,105
	Ghár	6,045	1,141	7,186	68,919	13,006	81,925	53,021	1,34,946	74,964	14,147	53,021	1,42,132
	Nára	373	77	450	51,700	10,579	62,279	31,495	93,774	52,073	10,656	31,495	94,224
	Wáhur	..	..	..	2,433	498	2,931	2,579	5,510	2,433	498	2,579	5,510
	Márui	..	..	..	1,599	327	1,926	..	1,926	1,599	327	..	1,926
	Bunds, Right Bank	9,457	1,035	11,392	29,890	6,116	36,006	10	36,016	39,347	8,051	10	47,408
Eastern Nára Canals.	Nára Supply Channel	..	..	..	2,566	712	3,278	103	3,381	2,566	712	103	3,381
	Eastern Nára	..	..	..	12,370	3,418	15,788	2,966	18,754	12,370	3,418	2,966	18,754
	Mithrau Canal	..	..	..	19,940	5,750	25,690	11,441	37,131	19,940	5,750	11,441	37,131
	Thar Canal	..	..	..	10,198	2,947	13,145	3,005	16,150	10,198	2,947	3,005	16,150
	Dimwáh	..	..	..	844	242	1,086	190	1,276	844	242	190	1,276
	Heranwáh	..	..	..	29	8	37	32	69	29	8	32	69
Hyderabad Canals.	Mehrabwáh	..	..	..	8,668	2,210	10,878	1,436	12,314	8,668	2,210	1,436	12,314
	Nasrat	..	..	..	15,416	4,347	19,763	2,502	22,265	15,416	4,347	2,502	22,265
	Navlákhi	..	..	..	14,524	4,095	18,619	8,721	27,340	14,524	4,095	8,721	27,340
	Dámbro	..	..	..	6,288	1,773	8,061	955	9,016	6,288	1,773	955	9,016	
	Dád	..	..	..	12,937	3,648	16,586	3,525	20,110	12,937	3,648	3,525	20,110
	Rein	..	..	..	17,257	4,866	22,123	1,763	23,886	17,257	4,866	1,763	23,886
	Alibahr Kacheri	..	..	..	4,986	1,270	6,256	629	6,885	4,986	1,270	629	6,885
	Márak	..	..	..	12,223	3,075	15,298	5,864	21,162	12,223	3,075	5,864	21,162
	Ghóro Máhmuda	..	..	..	19,028	5,365	24,393	8,103	32,496	19,028	5,365	8,103	32,496
	Kari Shumáli	..	..	..	8,231	2,320	10,551	4,263	14,814	8,231	2,320	4,263	14,814
	Nasir	..	..	..	16,883	4,760	21,643	4,187	25,830	16,883	4,760	4,187	25,830
	Sarfráz	..	..	..	8,637	2,200	10,837	1,720	12,557	8,637	2,200	1,720	12,557
	Other Canals	..	..	..	10,124	2,855	12,979	4,154	17,133	10,124	2,855	4,154	17,133
Fuleli Canals.	Fuleli	100	28	128	1,08,084	30,265	1,39,249	17,225	1,56,474	1,09,084	30,293	17,225	1,56,602
	Other Canals	..	..	..	17,492	4,896	22,388	2,396	24,784	17,492	4,896	2,396	24,784
Karáchi Canals.	Nára	873	216	1,089	8,153	2,018	10,171	15,143	25,314	9,026	2,234	15,143	26,403
	Phitta	..	..	..	1,627	403	2,030	982	3,012	1,627	403	982	3,012
	Canals north of Kotri	274	67	341	8,286	2,050	10,336	2,062	12,398	8,560	2,117	2,062	12,739
	Kalri	..	..	..	10,700	2,648	13,348	1,578	14,926	10,700	2,648	1,578	14,926
	Baghár	..	..	..	8,038	1,989	10,027	2,452	12,479	8,038	1,989	2,452	12,479
	Uchita	..	..	..	414	103	517	2,474	2,991	414	103	2,474	2,991
	Canals in Tatta, &c.	..	..	..	6,617	1,637	8,252	1,176	9,430	6,617	1,637	1,176	9,430
	Shal Canal	1,000	248	1,248	1,975	489	2,464	150	2,614	2,975	737	150	3,862
	Pinyári	19,985	4,945	24,930	54,199	13,301	67,510	12,237	79,747	74,104	18,336	12,237	1,04,677
	Canals in Mirpur Batoro	..	..	..	5,225	1,293	6,518	2,071	8,589	5,225	1,293	2,071	8,589
	Canals in Sujáwal	..	..	..	444	110	554	1,523	2,077	444	110	1,523	2,077
	Satta	..	..	..	3,006	744	3,750	1,617	5,367	3,006	744	1,617	5,367
	Canals in Jati	..	..	..	890	216	1,106	407	1,513	890	216	407	1,513
	Khánta	1,030	255	1,285	6,450	1,596	8,046	1,027	9,073	7,480	1,851	1,027	10,358
	Kokawári	..	..	..	1,098	272	1,370	2,071	3,441	1,098	272	2,071	3,441
	Canals in Shábbandar	..	..	..	1,951	483	2,434	409	2,843	1,951	483	409	2,843
	Bunds, Left Bank	37,554	9,292	46,846	55,572	13,750	69,322	147	69,469	93,126	23,042	147	1,16,315
	Bunds, Right Bank	..	..	..	18,223	4,509	22,732	17	22,749	18,223	4,509	17	22,749
Begári Canals		20,394	4,294	24,688	1,04,767	29,066	1,33,833	26,947	1,60,780	1,25,161	33,360	26,947	1,85,468
Shikárpur Canals		43,609	6,609	50,218	77,695	11,774	89,469	21,321	1,10,790	1,21,304	18,383	21,321	1,61,008
Ghár Canals		15,875	3,153	19,028	1,75,941	34,565	2,10,506	93,771	3,04,277	1,91,816	37,718	93,771	3,23,305
Eastern Nára Canals		..	..	..	45,947	13,077	59,024	17,737	76,761	45,947	13,077	17,737	76,761
Hyderabad Canals		..	..	..	1,55,202	42,784	1,97,986	47,822	2,45,808	1,55,202	42,784	47,822	2,45,808
Fuleli Canals		100	28	128	1,26,476	35,161	1,61,637	19,621	1,81,258	1,26,576	35,189	19,621	1,81,386
Karáchi Canals		60,716	15,023	75,739	1,92,788	47,701	2,40,489	47,543	2,88,032	2,53,504	62,724	47,543	3,63,771
	Total	1,40,694	29,107	1,69,801	8,78,816	2,14,128	10,92,944	2,74,762	13,67,706	10,19,510	2,43,235	2,74,762	15,37,507

J. E. WHITING, M.Inst.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE V.

Cultivation, Canal Revenue and Expenditure of 1883-84, as contrasted with three previous years.

Executive Charges.	Average of 3 previous Years.					1883-84.					Length in Miles of	
	Cultivation.	Canal Revenue.	Maintenance and Revenue Collection.	Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.	Cultivation.	Canal Revenue.	Maintenance and Revenue Collection.	Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.	Canals.	Bunds.
	Acres.	Rs.	Rs.	Rs.	Rs.	Acres.	Rs.	Rs.	Rs.	Rs.		
Begári Canals .. Desert Canal	87,915	1,15,500	23,824	20·62	·27	84,523	1,11,527	29,887	26·80	·35	115	..
Begári Canal	114,795	1,55,514	72,697	46·74	·63	146,043	2,26,200	72,577	32·09	·50	148	..
Kashmor Bund	215	848	79,517	..	..	2,122	3,804	58,316	..	..	..	48
Shikárpur Canals. Canals in Rohri	45,831	1,01,892	43,573	42·76	·95	44,365	1,03,995	49,726	47·82	1·12	212	..
Bunds in Rohri	3,587	7,283	11,777	..	..	2,305	5,214	9,319	..	..	..	54
Sind Canal	49,171	1,16,004	35,493	30·59	·72	42,972	1,02,930	28,083	27·28	·65	67	..
Sukkur-Begári Bund	....	125	30,086	..	..	....	105	23,662	..	..	..	86
Ghár Canals .. Sukkur Canal	66,615	1,21,217	54,334	44·82	·81	60,122	1,38,901	32,105	23·11	·53	127	..
Ghár	222,338	5,64,839	1,22,814	21·74	·55	199,441	6,44,450	1,34,946	20·94	·67	317	..
Nára	117,305	3,25,517	95,978	29·48	·81	107,565	3,14,625	93,774	29·80	·87	231	..
Wáhur	8,348	23,133	5,593	24·17	·66	7,100	16,703	5,510	32·99	·78	23	..
Márui	3,882	11,334	1,754	15·47	·45	3,446	9,051	1,926	21·28	·56	15	..
Bunds, Right Bank ..	287	703	18,564	..	..	23	153	36,016	..	..	..	108
Eastern Nára Canals. Nára Supply Channel ..	333	3,920	3,734	95·25	11·21	398	4,476	3,381	75·54	8·49	12	..
Eastern Nára Canal ..	13,236	44,623	19,811	44·39	1·49	9,655	33,312	18,754	56·30	1·94	20	110
Mithrau Canal	65,738	1,11,945	34,912	31·18	·53	64,969	1,15,380	37,131	32·18	·57	141	44
Thár Canal	8,177	13,155	12,516	95·14	1·53	16,706	30,204	16,150	53·47	·97	59	33
Dimwáh	876	1,616	1,185	73·32	1·35	1,276	1,901	1,276	67·12	1·00	18	..
Heranwáh	61	113	112	99·11	1·83	225	323	69	21·36	·30	3	..
Hyderabad Canals. Mehrabwáh	9,717	17,723	6,246	35·24	·64	9,637	19,315	12,314	63·75	1·28	59	..
Nasrat	14,810	38,313	34,498	90·04	2·32	11,359	29,517	22,265	75·43	1·96	66	..
Navlákhi	38,009	86,952	47,504	54·63	1·24	40,349	89,351	27,340	30·60	·68	137	..
Dámbro	6,388	14,528	6,068	41·76	·95	5,540	12,572	9,016	71·72	1·63	56	..
Dád	21,865	43,852	11,466	26·14	·52	20,889	39,106	20,110	51·42	·96	105	..
Rein	10,551	22,959	11,739	51·13	1·11	9,896	21,996	23,886	108·59	2·41	134	..
Alibahr Kacheri ..	8,794	15,979	6,139	38·41	·69	7,838	14,558	6,885	47·29	·88	56	..
Márak	46,967	96,569	14,919	15·45	·32	44,837	87,863	21,162	24·09	·47	194	..
Gharo Mahmuda ..	51,702	89,352	42,078	47·09	·81	52,453	82,286	32,496	39·05	·62	291	..
Kari Shumáli	33,555	42,901	15,798	36·82	·47	35,945	40,959	14,814	36·17	·41	214	..
Nasir	27,047	41,342	17,513	42·36	·64	24,333	41,456	25,830	62·30	1·06	128	..
Sarfráz	22,152	26,696	12,688	47·52	·57	19,988	26,298	12,557	47·75	·62	116	..
Other Canals	20,734	46,915	13,638	29·07	·65	19,331	42,781	17,133	40·05	·89	112	..
Fuleli Canals .. Fuleli	202,946	3,50,463	1,44,098	41·12	·71	197,947	3,75,152	1,56,474	41·70	·79	994	..
Other Canals	18,362	33,102	25,559	77·21	1·39	18,638	46,172	24,784	53·67	1·33	153	8
Karáchi Canals .. Nára	73,711	1,74,139	27,788	15·95	·37	73,858	1,51,408	25,314	16·72	·34	106	..
Phitta	8,286	20,409	4,660	22·83	·56	5,498	9,570	3,012	31·47	·55	27	..
Canals north of Kotri ..	13,268	26,949	12,986	48·19	·98	12,266	20,906	12,398	59·30	1·01	58	..
Kalri	9,365	21,025	21,236	101·00	2·26	6,228	14,448	14,926	103·30	2·40	136	..
Baghár	14,396	28,619	8,913	31·14	·62	13,155	21,932	12,479	56·89	·95	114	..
Uchita	13,954	33,484	4,746	14·17	·34	9,573	21,483	2,991	13·92	·31	44	..
Canals in Tatta, &c.	8,665	15,884	8,217	51·73	·94	6,464	12,057	9,430	78·21	1·46	96	..
Shal Canals	....	....	....	..	..	1,023	1,639	2,614	159·49	2·56	18	..
Pinyári	54,047	1,02,141	68,231	66·80	1·26	52,488	1,24,757	79,747	63·92	1·52	369	..
Canals in Mirpur Batoro	9,612	18,903	10,074	53·29	1·04	9,485	23,007	8,589	37·33	·91	99	..
Canals in Sujáwal ..	7,389	11,146	3,426	30·73	·46	6,966	15,518	2,077	13·38	·30	51	..
Satta	7,567	17,287	5,808	33·59	·77	6,847	17,396	5,367	30·85	·78	58	..
Canals in Jati	1,686	3,939	2,171	55·12	1·29	1,450	4,096	1,513	36·94	1·04	11	..
Khanta	5,957	10,967	6,364	58·03	1·07	6,159	8,704	9,073	104·24	1·47	59	..
Kokowari	15,026	29,951	4,093	13·67	·27	14,145	21,289	3,441	16·16	·24	100	..
Canals in Sháhbandar ..	2,391	4,897	2,407	49·15	1·00	2,029	4,031	2,843	70·53	1·40	32	..
Bunds, Left Bank	1,044	1,834	20,298	..	..	721	1,519	69,469	..	..	..	55
Bunds, Right Bank ..	647	279	15,791	..	..	240	114	22,749	..	..	..	28
Begári Canals	202,925	2,71,862	1,76,038	64·75	·86	232,688	3,41,531	1,60,780	47·08	·69	263	48
Shikárpur Canals	98,589	2,25,304	1,24,261	55·15	1·26	89,642	2,12,244	1,10,790	52·20	1·24	279	90
Ghár Canals	418,775	10,46,743	2,99,038	28·57	·71	377,697	11,23,883	3,04,277	27·07	·80	713	108
Eastern Nára Canals	88,416	1,75,374	72,270	41·20	·81	93,229	1,85,596	76,761	41·36	·82	253	187
Hyderabad Canals	312,292	5,84,081	2,40,294	41·15	·77	302,395	5,48,060	2,45,808	44·85	·81	1,668	..
Fuleli Canals	221,308	3,83,565	1,69,657	44·23	·76	216,585	4,21,324	1,81,258	43·02	·84	1,147	8
Karáchi Canals	247,011	5,21,853	2,27,267	43·55	·92	228,595	4,73,874	2,88,032	60·78	1·26	1,378	83
Total ..	1,589,316	*32,08,782	13,08,765	40·79	·82	1,540,831	33,06,512	13,67,706	41·36	·88	5,701	524

	Rs.		
* Net Canal Revenue	32,08,782	Add Agricultural Receipts ..	540
Agricultural Receipts	757		
	32,09,539	Total ..	33,07,052

J. E. WHITING, M.Inst.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE VI.

Direct and Indirect Receipts of Canal Revenue for 1883-84.

Executive Charges.		Water share of net Consolidated Revenue as in Table VII.	Deduct average before improvements.	Balance Irrigation share due to Canals.	Direct receipts Hakaba and Miscellaneous.	Difference of assessment on Jághir Land.	Total Direct and Indirect Receipts.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	Desert Canal	96,341	.....	96,341	15,186	26,112	1,37,639
	Begári Canal	1,95,030	24,856	1,70,174	31,170	39,234	2,40,578
	Kashmor Bund	3,804	.....	3,804	.....	.....	3,804
Shikárpur Canals	Canals in Rohri	1,02,392	.....	1,02,392	1,603	1,409	1,05,404
	Bunds in Rohri	5,209	.....	5,209	5	.....	5,214
	Sind Canal	1,01,464	.....	1,01,464	1,466	3,377	1,06,307
	Sukkur-Begári Bund	.....	.....	.....	105	.....	105
Ghár Canals	Sukkur Canal	1,38,145	71,550	66,595	756	1,535	68,886
	Ghár	6,39,430	1,16,832	5,22,598	5,020	15,009	5,42,627
	Nára	3,06,992	.....	3,06,992	7,633	29,351	3,43,976
	Wáhur	15,423	.....	15,423	1,280	.....	16,703
	Márui	9,051	.....	9,051	.....	.....	9,051
	Bunds, Right Bank	95	.....	95	58	.....	153
Eastern Nára Canals	Nára Supply Channel	1,027	.....	1,027	3,449	.....	4,476
	Eastern Nára	16,205	3,444	12,761	17,107	.....	29,868
	Mithrau Canal	1,14,513	.....	1,14,513	867	.....	1,15,380
	Thar Canal	29,691	.....	29,691	513	1,082	31,286
	Dimwáh	1,901	.....	1,901	.....	.....	1,901
	Heranwáh	323	.....	323	.....	.....	323
Hyderabad	Mehrabwáh	19,052	.....	19,052	263	16	19,331
	Nasrat	29,003	.....	29,003	516	787	30,306
	Navlákhi	88,028	.....	88,028	1,323	4,734	94,085
	Dambro	12,392	.....	12,392	180	740	13,312
	Dád	37,023	.....	37,023	2,083	11,708	50,814
	Rein	21,941	.....	21,941	55	47	22,043
	Alibahr Kacheri	14,164	8,427	5,737	394	1,423	7,554
	Márak	86,269	36,459	49,810	1,594	9,762	61,166
	Gháro Mahmuda	77,704	.....	77,704	4,582	13,450	95,736
	Kari Shumali	37,981	.....	37,981	2,978	4,608	45,567
	Násir	40,604	.....	40,604	852	1,736	43,192
	Sarfráz	25,095	11,155	13,940	1,203	2,352	17,495
	Other Canals	41,642	.....	41,642	1,139	3,944	46,725
Fuleli Canals	Fuleli	3,55,080	1,67,604	1,87,476	20,072	49,747	2,57,295
	Other Canals	44,909	.....	44,909	1,263	5,903	52,075
Karáchi Canals	Nára	1,45,333	.....	1,45,333	6,075	4,735	1,56,143
	Phitta	9,048	.....	9,048	522	890	10,460
	Canals north of Kotri	20,521	.....	20,521	385	2,480	23,386
	Kalri	13,790	.....	13,790	658	998	15,446
	Baghar	21,109	.....	21,109	823	3,186	25,118
	Uchita	21,372	.....	21,372	111	.....	21,483
	Canals in Tatta, &c.	11,406	.....	11,406	651	1,629	13,686
	Shál Canals	1,639	.....	1,639	.....	.....	1,639
	Pinyári	1,21,790	.....	1,21,790	2,967	2,773	1,27,530
	Canals in Mirpur Batoro	23,007	.....	23,007	.....	.....	23,007
	Canals in Sujáwal	15,503	.....	15,503	15	725	16,243
	Satta	17,265	.....	17,265	131	477	17,873
	Canals in Jati	4,046	.....	4,046	50	368	4,464
	Khánta	8,621	.....	8,621	83	534	9,238
	Kokowári	21,152	.....	21,152	137	.....	21,289
	Canals in Sháhbandar	3,481	.....	3,481	550	419	3,450
	Bunds, Left Bank	1,352	.....	1,352	114	730	2,196
	Bunds, Right Bank	.....	.....	.....	167	569	736
Begári Canals		2,95,175	24,856	2,70,319	46,356	65,346	3,82,021
Shikárpur Canals		2,09,065	.....	2,09,065	3,179	4,786	2,17,030
Ghár Canals		11,09,136	1,88,382	9,20,754	14,747	45,895	9,81,396
Eastern Nára Canals		1,63,660	3,444	1,60,216	21,936	1,082	1,83,234
Hyderabad Canals		5,30,898	56,041	4,74,857	17,162	55,307	5,47,326
Fuleli Canals		3,99,989	1,67,604	2,32,385	21,335	55,650	3,09,370
Karáchi Canals		4,60,435	.....	4,60,435	13,439	20,513	4,94,387
	Total	31,68,358	4,40,327	27,28,032	1,38,154	2,48,579	31,14,764
	Add Agricultural Receipts				540	.....	540
	Total				1,38,694	2,48,579	31,15,304

J. E. WHITING, M.Inst.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE VIA.

Actual Direct and Indirect Receipts of Canal Revenue in 1883-84 as shown in the General Revenue Accounts of Divisions prepared by the Examiner of Public Works Accounts.

Canals and Divisions.		Water Share of net Consolidated Revenue collected.	Deduct average before improvements.	Balance Irrigation Share due to Canals.	Direct Receipts Hakaba and Miscellaneous.	Difference of Assessment on Jághir Land.	Total Direct and Indirect Receipts.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals ...	Desert Canal ...	94,826	.....	94,826	15,186	26,112	1,36,124
	Begári Canal ...	1,93,571	24,856	1,68,715	31,170	39,234	2,39,119
	Kashmor Bund ...	3,804	.....	3,804	.....	.....	3,804
Shikárpur Canals	Canals in Rohri ...	1,01,845	.....	1,01,845	1,603	1,409	1,04,857
	Bunds in Rohri ...	5,205	.....	5,205	5	.....	5,210
	Sind Canal ...	1,04,187	.....	1,04,187	1,466	3,377	1,09,030
	Sukkur-Begári Bund ...	...	.....	.....	105	.....	105
Ghár Canals ...	Sukkur Canal ...	1,37,923	71,550	66,373	756	1,535	68,664
	Ghár ...	6,43,791	1,16,832	5,26,959	5,020	15,009	5,46,988
	Nára ...	3,09,133	.....	3,09,133	7,633	29,351	3,46,117
	Wahur ...	15,487	.....	15,487	1,280	.....	16,767
	Márui ...	9,025	.....	9,025	.....	.....	9,025
	Bunds, Right Bank ...	98	.....	98	58	.....	156
Eastern Nára ...	Nára Supply Channel ...	1,027	.....	1,027	3,449	.....	4,476
	Eastern Nára ...	16,188	3,444	12,744	17,107	.....	29,851
	Mithrau Canal ...	1,14,407	.....	1,14,407	867	.....	1,15,274
	Thar Canal ...	29,691	.....	29,691	513	1,082	31,286
	Dimwáh ...	1,901	.....	1,901	.....	.....	1,901
	Heranwáh ...	323	.....	323	.....	.....	323
Hyderabad Canals ...	Mehrabwáh ...	14,365	.....	14,365	263	16	14,644
	Nasrat ...	24,680	.....	24,680	516	787	25,983
	Navlákhi ...	86,101	.....	86,101	1,323	4,734	92,158
	Dambro ...	9,366	.....	9,366	180	740	10,286
	Dád ...	33,565	.....	33,565	2,083	11,708	47,356
	Rein ...	17,614	.....	17,614	55	47	17,716
	Alibahar Kacheri ...	14,365	8,427	5,938	394	1,423	7,755
	Marak ...	93,628	36,459	57,169	1,594	9,762	68,525
	Gháro Mahmuda ...	76,960	.....	76,960	4,582	13,450	94,992
	Kári Shumali ...	40,097	.....	40,097	2,978	4,608	47,683
	Násir ...	41,283	.....	41,283	852	1,736	43,871
	Sarfráz ...	27,440	1,155	16,285	1,203	2,352	19,840
	Other Canals ...	40,643	.....	40,643	1,139	3,944	45,726
Fuleli Canals ...	Fuleli ...	3,24,762	1,67,604	1,57,158	20,072	49,747	2,26,977
	Other Canals ...	23,166	.....	23,166	1,263	5,903	30,332
Karáchi Canals...	Nára ...	1,45,343	.....	1,45,343	6,075	4,735	1,56,153
	Phitta ...	9,302	.....	9,302	522	890	10,714
	Canals north of Kotri ...	20,240	.....	20,240	335	2,480	23,105
	Kalri ...	15,121	.....	15,121	658	998	16,777
	Baghar ...	23,702	.....	23,702	823	3,186	27,711
	Uchita ...	24,625	.....	24,625	111	.....	24,736
	Canals in Tatta, &c....	11,112	.....	11,112	651	1,629	13,392
	Shál Canals ...	1,497	.....	1,497	.....	.....	1,497
	Pinyari ...	1,19,418	.....	1,19,418	2,967	2,773	1,25,158
	Canals in Mirpur Batoro ...	20,714	.....	20,714	.....	.....	20,714
	Canals in Sujáwal ...	15,216	.....	15,216	15	725	15,956
	Satta ...	16,047	.....	16,047	131	477	16,655
	Canals in Jati ...	4,024	.....	4,024	50	368	4,442
	Khánta ...	10,194	.....	10,194	83	534	10,811
	Kokowári ...	20,575	.....	20,575	137	.....	20,712
	Canals in Shábbandar ...	3,545	.....	3,545	550	419	4,514
	Bunds, Left Bank ...	1,352	.....	1,352	114	730	2,196
	Bunds, Right Bank ...	.....	.....	.....	167	569	736
Begári Canals ...		2,92,201	24,856	2,67,345	46,356	65,346	3,79,047
Shikárpur Canals ...		2,11,237	.....	2,11,237	3,179	4,786	2,19,202
Ghár Canals ...		11,15,457	1,88,382	9,27,075	14,747	45,895	9,87,717
Eastern Nára ...		1,63,537	3,444	1,60,093	21,936	1,082	1,83,111
Hyderabad Canals ...		5,20,107	56,041	4,64,066	17,162	55,307	5,36,535
Fuleli Canals ...		3,47,928	1,67,604	1,80,324	21,335	55,650	2,57,309
Karáchi Canals ...		4,62,027	.....	4,62,027	13,439	20,513	4,95,979
	Total ...	31,12,494	4,40,327	26,72,167	1,38,154	2,48,579	30,58,900
	Add Agricultural Receipts ...				540	.....	540
	Total ...				1,38,694	2,48,579	30,59,440

J. E. WHITING, M.Inst.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE VII.

Area of Cultivation and consolidated Revenue for 1883-84.

Canals and Divisions.	Cultivation.			Consolidated Revenue.			Remissions.			Net consolidated Revenue.	Land Share 10 per cent.	Water Share 90 per cent.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif	Rabi.	Total.			
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals — Desert Canal	50,079	5,411	55,490	97,796	9,249	1,07,045	...	...	..	1,07,045	10,704	96,341
Begári Canal	1,03,099	2,203	1,05,302	2,17,449	3,936	2,21,385	4,674	11	4,685	2,16,700	21,670	1,95,030
Kashmor Bund	45	2,077	2,122	90	4,137	4,227	..	...	...	4,227	423	3,804
Shikárpur Canals — Canals in Rohri	33,171	10,520	43,691	86,946	28,933	1,15,879	2,107	3	2,110	1,13,769	11,377	1,02,392
Bunds in Rohri	1,740	565	2,305	6,128	2,087	8,215	2,427	...	2,427	5,788	579	5,209
Sind Canal	36,856	4,328	41,184	1,06,222	8,792	1,15,014	2,277	...	2,277	1,12,737	11,273	1,01,464
Sukkur Begári bund	...	...	...	...	...	...	...	...	...	...	...	...
Ghár Canals — Sukkur Canal	46,468	13,162	59,630	1,21,804	31,810	1,53,614	119	...	119	1,53,495	15,350	1,38,145
Ghár	1,70,523	24,262	1,94,785	6,29,736	89,696	7,19,432	8,955	...	8,955	7,10,477	71,047	6,39,430
Nára	73,867	24,651	98,518	2,57,444	88,962	3,46,406	5,304	...	5,304	3,41,102	34,110	3,06,992
Wáhur	6,505	595	7,100	18,044	2,001	20,045	2,908	...	2,908	17,137	1,714	15,423
Márui	2,465	981	3,446	6,604	3,478	10,082	26	..	26	10,056	1,005	9,051
Bunds right bank	9	14	23	43	63	106	...	...	...	106	11	95
Eastern Nára — Nára supply	10	388	398	24	1,117	1,141	...	...	...	1,141	114	1,027
Eastern Nára	1,204	8,451	9,655	2,489	16,130	18,619	13	600	613	18,006	1,801	16,205
Mithrau Canal	51,770	13,199	64,969	1,07,167	20,269	1,27,436	200	...	200	1,27,236	12,723	1,14,513
Thar Canal	13,003	3,056	16,059	28,778	4,309	33,087	29	68	97	32,990	3,299	29,691
Dimwáh	976	300	1,276	1,686	427	2,113	...	...	...	2,113	212	1,901
Heranwáh	198	27	225	331	28	359	...	...	...	359	36	323
Hyderabad Canals — Mehrabwáh	9,631	...	9,631	21,169	...	21,169	...	...	...	21,169	2,117	19,052
Nasrat	10,817	229	11,046	31,488	737	32,225	...	...	...	32,225	3,222	29,003
Naolákhi	36,218	2,234	38,452	92,170	5,639	97,809	...	...	...	97,809	9,781	88,028
Dámbro	4,731	572	5,303	12,699	1,070	13,769	...	...	...	13,769	1,377	12,392
Dád	15,630	1,517	17,147	36,454	4,683	41,137	...	...	...	41,137	4,114	37,023
Rein	9,732	139	9,871	23,752	627	24,379	...	...	...	24,379	2,438	21,941
Alibahr Kacheri	7,084	1	7,085	15,674	64	15,738	...	...	...	15,738	1,574	14,164
Márak	39,104	50	39,154	95,624	293	95,917	63	...	63	95,854	9,585	86,269
Gháro Mahmuda	41,393	909	42,302	83,877	2,461	86,338	...	...	...	86,338	8,634	77,704
Kari Shumáli	28,069	229	28,298	42,104	139	42,243	42	...	42	42,201	4,220	37,981
Nasir	22,436	605	23,041	44,292	937	45,229	113	...	113	45,116	4,512	40,604
Sarfráz	16,639	59	16,698	27,916	73	27,989	106	...	106	27,883	2,788	25,095
Other Canals	15,671	2,018	17,689	41,068	5,369	46,437	169	...	169	46,268	4,626	41,642
Fuleli Canals — Fuleli	1,56,645	5,668	1,62,313	3,84,555	11,003	3,95,558	1,019	6	1,025	3,94,533	39,453	3,55,080
Other Canals	16,341	323	16,664	47,973	1,937	49,910	11	...	11	49,899	4,990	44,909
Karáchi Canals — Nára	34,972	29,218	64,190	86,809	76,715	1,63,524	1,086	957	2,043	1,61,481	16,148	1,45,333
Phitta	3,626	1,120	4,746	7,658	2,659	10,217	164	...	164	10,053	1,005	9,048
Canals north of Kotri	8,693	1,857	10,550	19,403	4,660	24,063	1,262	...	1,262	22,801	2,280	20,521
Kalri	5,404	423	5,827	15,832	2,003	17,835	2,447	65	2,512	15,323	1,533	13,790
Baghar	11,431	477	11,908	24,331	3,474	27,805	3,287	1,064	4,351	23,454	2,345	21,109
Uchita	9,133	440	9,573	28,574	1,480	30,054	6,163	144	6,307	23,747	2,375	21,372
Canals in Tatta, &c.	5,543	181	5,724	15,369	1,213	16,582	3,829	80	3,909	12,673	1,267	11,406
Shál Canals	1,021	2	1,023	3,240	20	3,260	1,439	...	1,439	1,821	182	1,639
Pinyári	50,356	975	51,331	1,48,235	7,842	1,56,077	20,696	59	20,755	1,35,322	13,532	1,21,790
Canals in Mirpur B.	9,350	135	9,485	29,184	615	29,799	4,233	3	4,236	25,563	2,556	23,007
Canals in Sujáwal	6,518	130	6,648	18,551	686	19,237	2,011	...	2,011	17,226	1,723	15,503
Satta	6,451	187	6,638	18,748	1,245	19,993	591	219	810	19,183	1,918	17,265
Canals in Jati	1,165	37	1,202	3,965	696	4,661	41	124	165	4,496	450	4,046
Khánta	5,893	64	5,957	11,292	732	12,024	2,273	172	2,445	9,579	958	8,621
Kokowari	13,731	414	14,145	30,471	1,310	31,781	8,246	33	8,279	23,502	2,350	21,152
Canals in Sháhbandar	1,705	165	1,870	4,063	703	4,766	872	26	898	3,868	387	3,481
Bunds left bank	392	26	418	1,428	109	1,537	...	35	35	1,502	150	1,352
Bunds right bank	...	...	...	...	...	...	...	...	...	...	...	...
Begári Canals	153,223	9,691	162,914	3,15,335	17,322	3,32,657	4,674	11	4,685	3,27,972	32,797	2,95,175
Shikárpur Canals	71,767	15,413	87,180	1,99,296	39,812	2,39,108	6,811	3	6,814	2,32,294	23,229	2,09,065
Ghár Canals	299,837	63,665	363,502	10,33,675	2,16,010	12,49,685	17,312	...	17,312	12,32,373	1,23,237	11,09,136
Eastern Nára	67,161	25,421	92,582	1,40,475	42,280	1,82,755	242	668	910	1,81,845	18,185	1,63,660
Hyderabad Canals	257,155	8,562	265,717	5,68,287	22,092	5,90,379	493	...	493	5,89,886	58,988	5,30,898
Fuleli Canals	172,986	5,991	178,977	4,32,528	12,940	4,45,468	1,030	6	1,036	4,44,432	44,443	3,99,989
Karáchi Canals	175,384	35,851	211,235	4,67,053	1,06,162	5,73,215	58,640	2,981	61,621	5,11,594	51,159	4,60,435
Total	1,197,513	164,594	1,362,107	31,56,649	4,56,618	36,13,267	89,202	3,669	92,871	35,20,396	3,52,038	31,68,358

J. E. WHITING, M. INST. C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE VIII.

Discharges of certain Canals, areas of Crops of different kinds irrigated, and Duty of Water per Cubic foot of Supply for Kharif Season, 1883.

Executive Charges and Canals.			Average discharge.	Area of Crops Irrigated.				Area of Land Irrigated.		Total Area irrigated.	Area irrigated per Cubic foot of supply.
				Jowári.	Bájri.	Rice.	Other Crops.	By Lift.	By Flow.		
			Cubic Feet per Second.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Upper Sind Frontier	Begári Canal	Desert Canal ...	1,149	58,496	6,097	57	9,774	8,447	65,977	85,282	74·22
		Muradwáh	308	5,665	3,425	233	899	948	9,275	12,479	40·51
		Begári Canal ...	3,153	96,964	1,055	4,673	44,149	32,545	114,296	152,982	48·52
Shikárpur Collectorate	Shikárpur Canal	Sind Canal	1,056	12,845	114	19,252	4,594	6,837	29,968	36,805	34·85
Thar and Párkar	Eastern Nára	Mithrao Canal ...	911	110	8,288	34,782	8,608	12,910	38,878	31,788	56·85
Shikárpur Collectorate	Ghár Canal	Sukkur Canal ...	1,786	13,043	298	20,353	12,774	4,485	41,983	46,671	26·13
		Ghár Canal	5,885	13,568	992	1,45,617	10,346	1,578	168,945	174,509	29·65
Hyderabad Collectorate	Hyderabad Canal	Nasrat	210·40	7,927	1,602	26	1,262	9,121	1,696	11,120	52·851
		Ghaluwáh	696·384	1,530	17,008	...	9,624	28,127	35	36,218	52·008
		Márak	905·444	3,493	20,288	29	15,278	38,422	666	44,787	49·464
		Navlákhi	951·974	22,874	6,390	276	6,646	27,260	8,926	37,906	39·818
Ditto	Fuleli Canal	Fuleli	4,928	550	41,922	1,00,546	14,539	55,529	102,028	157,557	31·97
Karáchi Collectorate	Karáchi Canal	Western Nára ...	1,108	9,153	216	22,117	23,994	10,739	44,741	55,480	50·0
		Kalri	281	191	1,214	3,101	1,321	2,432	3,395	5,827	20·7
		Pinyári	2,432	12	2,817	46,488	1,951	3,827	47,431	51,268	21·07

J. E. WHITING, M. INST. C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE IX.

Rainfall in the Province of Sind for 1883-84.

Collectorates and Tálukas.			April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Total.
			In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Upper Sind.		Kashmor	0·10	0·17	...	0·43	...	0·03	...	...	...	0·18	0·60	0·34	1·85
		Thul	0·15	0·33	...	2·22	...	...	...	...	...	0·10	0·43	0·09	3·32
		Jacobabad	0·07	...	...	4·35	...	...	...	...	...	0·02	0·56	0·16	5·16
		Shahdádpur	...	...	...	...	..	...	...	...	...	...	0·64	0·17	0·81
Shikárpur Collectorate.	Shikárpur Canals.	Ubauro	...	..	...	3·09	...	0·15	...	...	..	0·01	1·09	0·18	4·52
		Mirpur	...	0·24	...	2·63	0·02	0·5	...	...	..	...	1·20	0·14	4·28
		Ghotki	...	0·04	...	3·73	...	...	...	...	...	0·01	0·93	0·10	4·81
		Saidpur	...	...	...	...	...	...	...	...	...	...	...	..	...
		Rohri	...	...	0·61	1·82	...	0·1	...	...	...	0·03	0·47	0·04	2·98
		Shikárpur	...	...	...	1·38	...	...	...	...	...	0·12	0·98	0·06	2·54
		Sukkur	...	..	0·04	2·07	...	0·1	...	...	...	0·06	1·23	0·08	3·49
		Garhi Yásen	...	...	...	1·28	...	...	...	...	...	0·14	0·96	0·03	2·41
	Ghár Canals.	Rato-dero	...	0·42	...	0·64	...	...	...	...	...	...	0·61	...	1·67
		Sujáwal	...	0·12	...	2·11	...	...	...	...	0·02	0·06	...	...	2·31
		Lárkhána	...	0·94	...	0·72	...	...	...	...	...	0·06	0·76	0·09	2·57
		Kambar	...	0·90	...	2·70	...	0·1½	...	...	...	0·01	0·07	...	3·69½
		Bákráni	...	...	...	...	...	...	...	...	...	0·07½	0·97	0·22	1·26½
		Nasirabad	...	0·12	...	8·61	...	...	...	...	...	...	...	...	8·73
		Mehar	...	0·50	...	3·01	...	0·10	...	...	...	0·08	1·11	0·49	5·29
		Tharri Mohbat	...	...	...	...	...	...	...	...	...	0·13	1·20	0·39	1·72
		Wárah	...	...	...	...	...	...	...	...	...	...	0·86	0·14	1·00
		Kakar	...	...	...	3·95	...	...	...	...	...	...	...	...	3·95
		Khairpur Nátheshán ...	...	...	...	...	...	0·11	...	...	...	0·05	1·17	0·20	1·53
		Tigar	...	0·91	...	1·73	...	..	...	...	...	...	...	...	2·64
		Labdarya	...	0·64	...	1·30	...	...	...	...	0·01	...	...	...	1·95
Thar and Párkar.	Eastern Nára Canals.	Khipra	...	...	0·30	3·36	0·04	1·24	...	...	...	...	0·09	...	5·03
		Umarkot	...	...	0·15	2·29	0·12	2·20	0·11	...	...	...	0·16	..	5·03
		Mitti	...	...	1·77	4·58	0·23	1·50	...	...	...	...	...	...	8·08
		Nagar	...	...	0·73	8·40	..	4·18	...	...	...	...	...	...	13·31
Hyderabad Collectorate.	Hyderabad Canals.	Kandiaro	...	...	...	1·10	...	...	...	...	...	...	1·06	...	2·16
		Naoshahro	....	0·46	...	2·05	...	...	...	...	...	...	0·35	...	2·86
		Tháru Sháh	..	...	...	2·62	...	..	...	...	...	0·04	1·10	...	3·76
		Moro	...	0·35	...	2·41	...	...	...	...	...	...	0·89	...	3·65
		Sakrand	...	...	0·37	2·39	...	1·40	...	..	...	...	0·42	...	4·58
		Hála	...	...	0·30	2·80	...	1·15	...	...	...	...	0·47	...	4·72
		Shahdádpur	...	...	0·30	5·37	...	0·20	...	...	...	...	...	...	5·87
		Tando Adam	...	...	0·81	3·99	...	0·50	...	...	...	0·06	0·36	0·02	5·74
		,, Alahyar	...	..	0·41	5·45	...	0·54	...	...	...	...	0·30	...	6·70
		Mirpur Khás	...	0·01	0·75	4·64	0·02	2·65	...	...	...	...	0·16	...	8·23
	Fuleli Canals.	Hyderabad	...	...	0·45	2·43	...	0·58	...	...	...	...	0·30	...	3·76
		Tando Muhammad Khán...	...	...	...	7·20	...	1·30	...	...	...	...	...	...	8·50
		Dehro Mohbat	...	...	...	2·79	0·27	0·50	...	...	...	...	0·06	...	3·62
		Tando Bágo	...	...	3·05	4·42	0·65	1·26	...	...	...	...	0·18	0·01	9·57
		Badin	...	...	1·65	5·21	0·53	2·16	0·25	...	...	...	0·10	...	9·90
		Guni	...	...	2·00	...	...	...	...	...	...	...	0·13	0·06	2·19
		Digri	...	...	0·28	...	...	...	...	...	...	...	...	...	0·28
Karáchi Collectorate.	Karáchi Canals.	Dádu	...	...	...	4·05	...	...	...	...	...	...	1·04	...	5·09
		Johi...	...	..	...	1·73	..	0·50	...	...	...	...	1·51	...	3·74
		Sehwan	...	...	...	5·99	...	...	...	...	...	...	1·01	...	7·00
		Mánjhand	...	...	0·36	5·18	...	0·55	...	...	...	...	0·56	...	6·65
		Kotri	...	...	0·58	5·22	...	0·88	...	...	...	...	0·31	...	6·99
		Bula Khán...	...	...	0·24	3·22	...	1·70	...	...	...	...	0·58	...	5·74
		Jerruck	...	...	1·72	7·12	...	0·52	...	...	...	...	0·10	...	9·46
		Tatta	...	...	0·74	4·63	0·02	2·31	...	...	...	...	0·08	0·03	7·81
		Sákro	...	...	2·40	5·36	...	0·51	...	...	...	...	0·16	0·18	8·61
		Belo...	...	...	1·30	5·09	...	0·48	...	...	...	..	0·03	...	6·90
		Mirpur Batoro	...	...	1·46	4·21	...	0·74	...	...	...	...	0·05	0·09	6·55
		Sujáwal	...	...	...	...	...	...	...	...	...	...	...	...	...
		Sháhbandar	...	...	1·60	5·23	0·06	1·80	...	...	...	...	0·11	0·30	9·10
		Kotri Ghorábari	...	...	1·05	5·75	...	1·05	...	...	...	...	0·40	0·31	8·56
		Keti Bandar	...	...	1·00	6·02	0·02	0·35	0·06	...	...	...	0·17	0·30	7·92
		Mugalbin	...	...	0·51	8·43	0·08	0·82	...	...	...	...	0·08	0·05	9·89
		Karáchi	..	...	0·32	5·53	...	0·28	...	...	...	0·10	0·62	0·09	6·94

J. E. WHITING, M. INST. C E.,

Acting Superintending Engineer for Irrigation in Sind.

General Abstract of Financial Results of Irrigation

		WORKS IN									
		PRODUCTIVE PUBLIC WORKS.				IRRIGATION AND NAVIGATION ORDINARY—WORKS FOR WHICH CAPITAL AND REVENUE					
		Desert Canal.	Begári Canal.	Eastern Nára Works.	Total.	Sukkur Canal.	Ghár Canal.	Mehrabwáh.	Alibhár Kacheri Canal.	Marak Great Canal.	Surfrazwáh.
Capital Outlay.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
During year	Direct ...	77,581	88,562	2,66,628	4,32,771	20,635	...	15,414	...	...	...
	Indirect ...	1,669	1,906	5,686	9,261	3,416	...	431	...	...	...
	Total ...	79,250	90,468	2,72,314	4,42,032	24,051	...	15,845	...	...	...
To end of year ...	Direct ...	10,19,650	14,71,792	40,42,636	65,34,078	13,00,610	4,15,537	65,636	23,207	1,93,600	1,18,559
	Indirect ...	36,201	44,507	1,59,923	2,40,631	59,317	25,440	1,840	710	7,548	6,121
	Total ...	10,55,851	15,16,299	42,02,559	67,74,709	13,59,927	4,40,977	67,476	23,917	2,01,148	1,24,680
Gross Revenue.											
During year	Direct ...	15,186	31,170	21,936	68,292	756	5,020	263	394	1,594	1,203
	Indirect ...	94,826	1,68,715	1,60,093	4,23,634	66,373	5,26,959	14,365	5,938	57,169	16,285
	Total ...	1,10,012	1,99,885	1,82,029	4,91,926	67,129	5,31,979	14,628	6,332	58,763	17,488
To end of year ...	Direct ...	43,345	1,04,004	4,72,503	6,19,852	7,930	1,61,874	263	8,708	36,860	21,969
	Indirect ...	9,63,510	25,79,337	33,40,819	68,83,666	4,74,200	93,34,340	14,365	66,757	4,93,438	1,07,633
	Total ...	10,06,855	26,83,341	38,13,322	75,03,518	4,82,130	94,96,214	14,628	75,465	5,30,298	1,29,602
Working Expenses.											
During year	Direct ...	29,887	72,577	76,761	1,79,225	32,105	1,42,132	12,314	6,885	21,162	12,557
	Indirect ...	770	1,834	1,765	4,369	551	1,950	309	177	431	308
	Total ...	30,657	74,411	78,526	1,83,594	32,656	1,44,082	12,623	7,062	21,593	12,865
To end of year ...	Direct ...	2,58,713	14,75,232	19,76,457	37,10,402	6,43,774	24,09,242	12,314	66,721	1,82,201	1,26,818
	Indirect ...	7,954	41,241	92,119	1,41,314	20,886	56,482	309	2,143	5,031	5,269
	Total ...	2,66,667	15,16,473	20,68,576	38,51,716	6,64,660	24,65,724	12,623	68,864	1,87,232	1,32,087
Net Revenue.											
During year		79,355	1,25,474	1,03,503	3,08,332	34,473	3,87,897	2,005	—730	37,170	4,623
To end of year		7,40,188	11,66,868	17,44,746	36,51,802	—1,82,530	70,30,490	2,005	6,601	3,43,066	—2,485
Simple Interest.											
During year		39,234	57,100	1,56,373	2,52,707	.....	...	...	...	...	...
To end of year		3,10,733	7,69,740	28,23,202	39,03,675	.....	...	...	...	...	...
Net profit after paying off Interest.											
During year		40,121	68,374	- 52,870	55,625	.....	...	...	...	...	...
To end of year		4,29,455	3,97,128	-10,78,456	-2,51,873	... ..	...	...	...	...	...

N.B.—(1) Direct outlay under working expenses includes share of cost of collection in the Civil Department.
(2) Interest charges on account of works other than Productive Public Works have been omitted as they have been eliminated from the administrative account per Government of India's Circular No. IV. P. W., dated 1st May 1884, communicated in G. R. No. 223 of 23rd idem.

Works in Sind for and up to the close of 1883-84.

OPERATION.

Accounts are kept.		Grand Total.	Irrigation and Navigation Ordinary—Works for which only Revenue Accounts are kept.					
Fuleli Canals	Total.		Under Executive Engineer, Shikárpur Canals.	Under Executive Engineer, Ghár Canals.	Under Executive Engineer, Hyderabad Canals.	Under Executive Engineer, Fuleli Canals.	Under Executive Engineer, Karachi Collectorate Canals.	Total.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
...	36,049	4,68,820	...		...	...	...	...
...	3,847	13,108	...	...	...	...	...	...
...	39,896	4,81,928	...	...	...	...	...	...
10,77,561	31,94,710	97,28,788	..	...	...	...	...	...
43,286	1,44,262	3,84,893	...	...	...	...	...	...
11,20,847	33,38,972	1,01,13,681	...	..	...	...	...	...
20,072	29,302	97,594	3,179	8,971	13,708	1,263	13,439	40,560
1,57,158	8,44,247	12,67,881	2,11,237	3,33,743	3,70,309	23,166	4,62,027	14,00,482
1,77,230	8,73,549	13,65,475	2,14,416	3,42,714	3,84,017	24,429	4,75,466	14,41,042
5,14,959	7,52,563	13,72,415	...	...	...	...	...	...
28,72,222	1,33,62,955	2,02,46,621	...	...	...	...	...	...
33,87,181	1,41,15,518	2,16,19,036	...	...	...	...	...	...
1,56,602	3,83,757	5,62,982	1,53,515	1,49,068	1,92,890	24,784	3,62,775	8,83,032
4,119	7,845	12,214	...	...	...	...	...	...
1,60,721	3,91,602	5,75,196	1,53,515	1,49,068	1,92,890	24,784	3,62,775	8,83,032
33,83,857	68,24,927	1,05,35,329	...	...	...	...	...	...
1,06,785	1,96,905	3,38,219	...	...	...	...	...	...
34,90,642	70,21,832	1,08,73,548	...	...	...	...	...	...
16,509	4,81,947	7,90,279	60,901	1,93,646	1,91,127	—355	1,12,691	5,58,010
—1,03,461	70,93,686	1,07,45,488	...	...	...	..	...	...
...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...

Expenditure on and Receipts from Agricultural Works for which Capital and Revenue Accounts are not kept.

	Expenditure.	Receipts.
Begári Canals.	Rs.	Rs.
Survey of Unharwáh Project	256	
Kashmor Bund.		
Strengthening Kashmor Bund	15,481	
Constructing Falls on Miraniwáh	4,657	
Maintenance, conservancy and repairs of Kashmor Bund	40,497	
Maintenance of Garden at Bádáni	480	
Rent of Telegraph Line and Office at Badani ...	1,800	
Maintenance of Miraniwáh...	2,535	
Do. of Buxaliwáh.	309	
Re-opening Nurwáh from Kashmor Bund ...	2,237	
General charges for Establishment and tools and plant	14,372	
Share of collection charges in the Civil Department.	380	
	83,004	422
Add—Irrigation share of Land Revenue ...	...	3,804
Total Begári Canals ...	83,004	4,226
Shikárpur Canals.		
Maintenance and conservancy of Kásimpur Bund	5,994	
General charges for Establishment and tools and plant	1,499	
Total Shikárpur Canals...	7,493	26
Ghár Canals	...	70
Karáchi Collectorate Canals...	...	22
Mathematical Instrument and Drawing Material Depôt in Sind ...	996	...
Total Karáchi Collectorate Canals... ...	996	22
Grand Total ...	(a)91,493	4,344

(a) Exclusive of Rs. 1,983, debited to Agricultural Works in Fuleli District on account of establishment employed for surveys in the Sibi District as it does not pertain to any Irrigation Works in Sind Province.

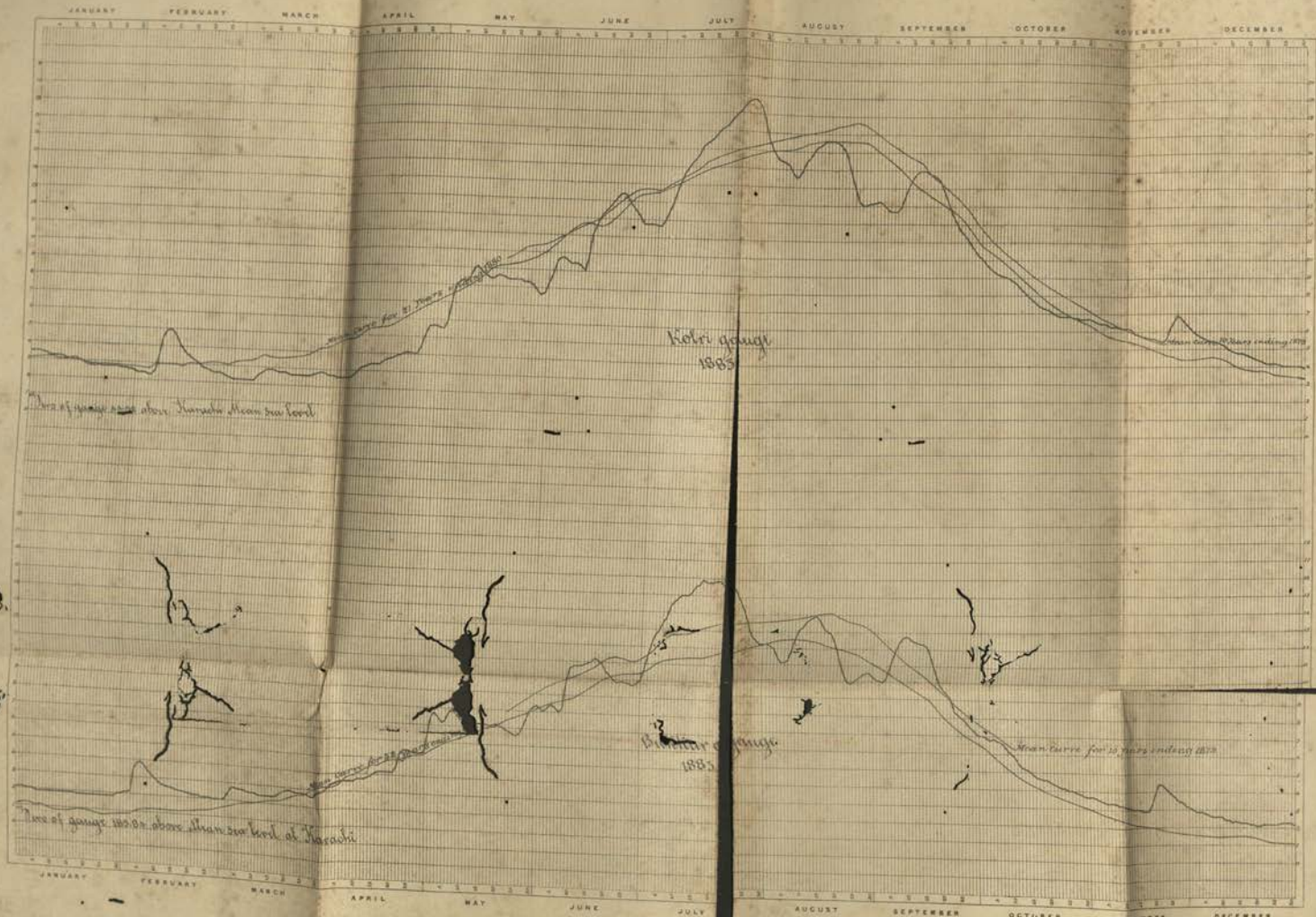
Memorandum of Loss to the Canals on account of difference between Assessments of Water-rates on Jághir Lands and the Assessments at the Ordinary Rates in force for Government Lands.

Works.	Loss. To end of 1882-83.	Loss. During 1883-84.	Loss. Total.	Remarks.
	Rs.	Rs.	Rs.	
Productive Public Works.				
Desert Canal	*43,826	26,112	69,938	*Includes Rs. 7,618 on account of lands in Kelat Territory as per amended Statement for 1882-83 received from the Political Agent, Jacobabád.
Begári Canal	†87,173	39,234	1,26,407	
Eastern Nára Works	3,428	1,082	4,510	
Total Productive Public Works ...	1,34,427	66,428	2,00,855	† Do. Rs. 1,873, do.
Irrigation and Navigation Works for which Capital and Revenue Accounts are kept.				
Sukkur Canal	1,837	1,535	3,372	
Ghár Canal	23,015	15,009	38,024	
Mehrabwáh	...	16	16	
Alibahr Kacheri Canal	8,449	1,423	9,872	
Márak Great Canal	41,873	9,762	51,635	
Surfrazwáh	20,185	2,352	22,537	
Fuleli Canal	4,01,555	49,747	4,51,302	
Total Works for which Capital and Revenue Accounts are kept ...	4,96,914	79,844	5,76,758	
Works for which only Revenue Accounts are kept.				
Under Executive Engineer Shikárpur Canals	...	4,786	...	
Do. do. Ghár do.	...	29,351	...	
Do. do. Hyderabad do.	...	41,754	...	
Do. do. Fuleli do.	...	5,903	...	
Do. do. Karáchi Collectorate Canals	...	20,513	...	
Total Works for which only Revenue Accounts are kept	...	1,02,307	...	
Total Irrigation and Navigation ...	...	1,82,151	...	
Grand Total ...	...	2,48,579	...	

J. GRIERSON, Lieut.-Col., S. C.,
Acting Examiner of Public Works Accounts.

BOMBAY : PRINTED AT THE GOVERNMENT CENTRAL PRESS.

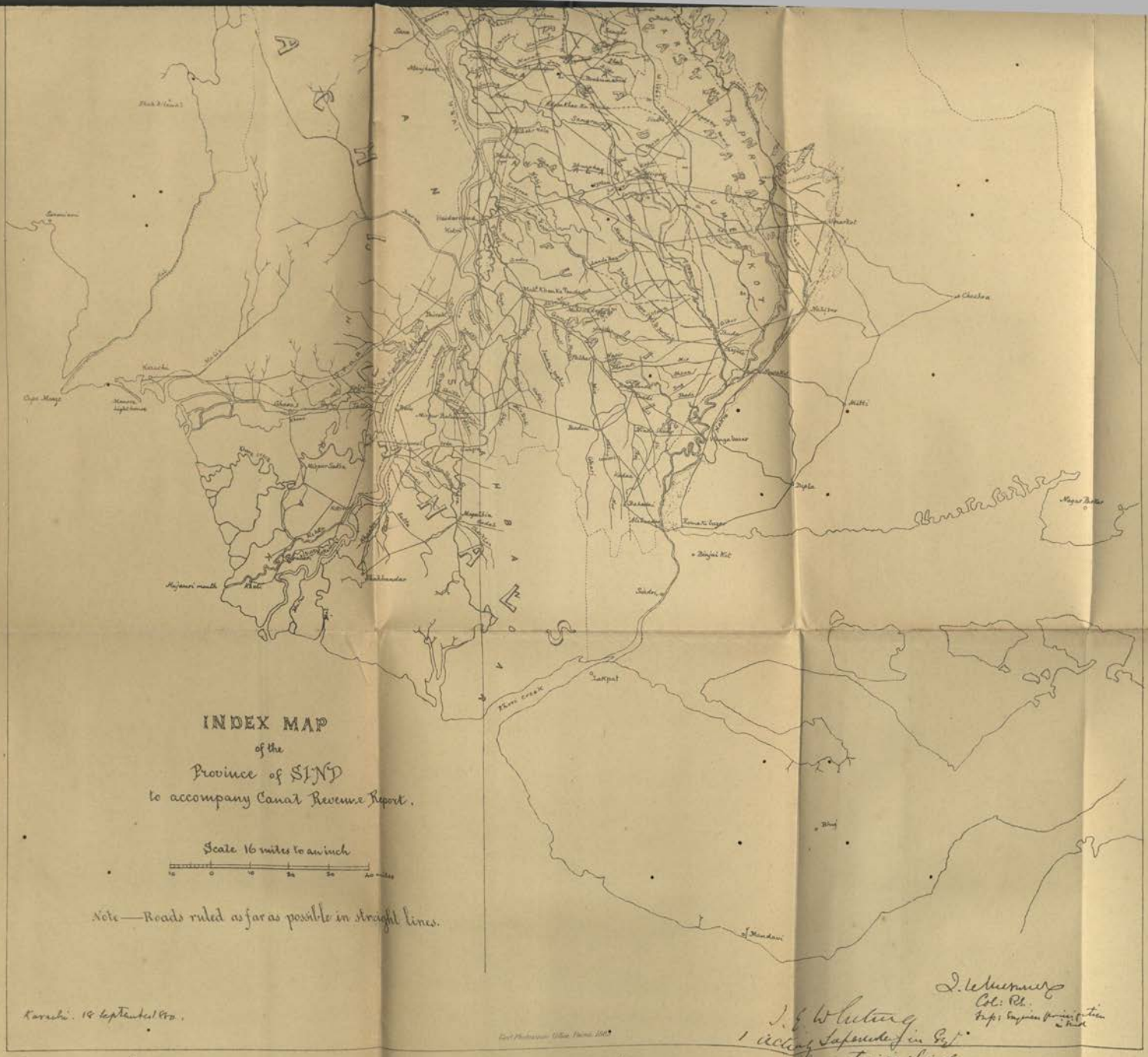
LIBRARY
OF THE
BOMBAY
BRANCH
OF THE
ROYAL ASIATIC SOCIETY



Sectional Paper to register the rise and fall of rivers &c. Supplied by the Geographical Branch of the Public Works Department, India Office, London, 1870.

J. E. Whiting M.I.C.E.
Superintending Engineer for irrigation in Sind.

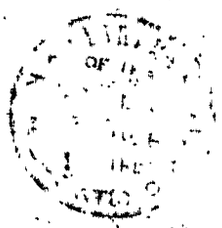
BECHUANAS
SHIANGANE
KANYE
MOLEPOLOLE
MAHALSE
KHUDU
BAMANGWATO
BAKALAHARI
MAHURUTSI
BAKWENA


INDEX MAP
of the
Province of SIND
to accompany Canal Revenue Report.
Scale 16 miles to an inch
Note—Roads ruled as far as possible in straight lines.
Karachi. 14 September 1860.
D. Lethbridge
Col: Rl.
Dept: Engineer Service in Sind
D. G. Wheeler
1 acting Superintendg Engr
Irrigation in Sind
Camp Rohree
4/2/65.

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1884-85.



133825

BOMBAY BRANCH
OF THE
Royal Asiatic Society.
CLASS

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1884-85.

B 1169—a

INDEX.

	Page
Letter from the Superintending Engineer for Irrigation in Sind, No. 3458, dated 15th December 1885	1
General review of the results for the whole Province of Sind	3 to 11
Begári Canals	11 to 14
Shikárpur Canals	14 & 15
Ghár Canals	16 to 18
Eastern Nára Canals	18 to 20
Hyderabad Canals	20 & 21
Fuleli Canals	21 & 22
Karáchi Canals	22 & 23
Memo. from the Commissioner in Sind, No. 4918, dated 22nd December 1885 ...	24 & 25
Tables accompanying Superintending Engineer's letter, I. to IX.	27 to 35
General Abstract of Financial results for and up to the close of 1884-85 ...	36 & 37
Memo. of loss to Canals on account of difference between assessments of water-rates on Jághír lands and the assessments at the ordinary rates in force for Government lands	38
Statements Nos. I-B, I-C, II-C, III-C, and IV-C	39 to 43
Chart showing readings at Kotri and Bukkur Gauges for 1884.	
Index Map of the Province of Sind.	

No. 3458 of 1885.

Public Works Department.

From

The SUPERINTENDING ENGINEER

For Irrigation in Sind;

To

The JOINT SECRETARY to GOVERNMENT,

Public Works Department (Irrigation), Bombay.

Office of Superintending Engineer in Sind,
Camp Sehwan, 15th December 1885.

Sir,

I have the honor to forward my irrigation revenue report for 1884-85 with the usual tables, charts, and Index map of Sind.

2. With reference to Government Resolution No. 147W, I.—350 of 1885 in regard to the adoption of uniform statistical statements in the revenue reports of irrigation works ordered by Her Majesty's Secretary of State for India, I forward also statements Ib., Ic., IIc., IIIc. and IVc. showing the financial results of first class irrigation works in Sind for, and to the end of, 1884-85, prepared in the prescribed form. I fear it will be impossible to submit the other statements, as the canals in Sind, as the Government of Bombay are aware, are too many in number to do so. Efforts however will be made, and if possible some of them, if not all, will be prepared and submitted with the next report.

3. I regret that the report is submitted still a little behind time, but as the general revenue accounts of the irrigation works in the province were received from the Examiner, Public Works Accounts, on the 8th ultimo, and the jamábandi statements from one of the revenue authorities on the 24th idem only, it was impossible to complete the statistics and take the report on hand in time to submit it within the prescribed date, namely the 15th November. The report, however, is submitted much earlier than previous ones.

4. Attached to the report are the general abstract of financial results and memorandum of loss to the canals on account of difference between assessments of water rates on jághir lands and assessments at the ordinary rates in force for Government lands.

I have the honor to be,
Sir,
Your most obedient Servant,
J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

Through the Commissioner in Sind.

ANNUAL REVENUE REPORT

OF THE

IRRIGATION DEPARTMENT IN SIND FOR 1884-85.

The Indus gave premonitory symptoms during the month of May as to the inundation of 1884: but it did not rise to any sensible extent until the 3rd June, and on the 26th it reached a height of 13½ feet on the gauge at Bukkur; falling to 11′ 4″ on the 4th July, it again rose to 13′ 8″ on the 12th and fell to 11′ 10″ on the 20th idem, when it again rose and reached 15′ 7″ on the 2nd August. After this another fall occurred reducing the height to 13′ 8″ on the 8th August: these falls discouraged the cultivators and kept cultivation backward for a time; but a rise beginning again on the 10th idem brought the river to its maximum height for the year, *viz.* 15′ 9″, on the 19th August. The final fall set in two days after. From this date and during the greater part of September the river, though varying, maintained heights, which plotted, show a curve considerably over the mean for the 10 years ending 1879, so that all things considered, and especially the good average height from 5th August to 10th September, the inundation of the year may be said to have been a tolerably favourable one, both in its duration and general steadiness; and hence resulted, 1st, an ample supply of water in the canals; 2nd, a marked extension in cultivation; and 3rd, a plentiful outturn and increase in revenue.

2. The rainfall in the Province, as will be seen from Table IX. appended, was heavy—heavy too at one time to such a degree that the kharif crops suffered a little in consequence: but the loss sustained from this cause was more than compensated for by the benefit derived from the extensive growth of grass throughout the country, which of course was of immense advantage to the cattle of the Province generally, and so of importance not only to the cultivators but to Government in the matter of transport animals. The rainfall was general, and occurring as it did during the months of June, July, August, and September made up largely for the depressions in the Indus curve noticed in the above paragraph, showing that even in Sind, lying as it does just outside the regular track of the south-west monsoon and where therefore cultivation depends on canals taking off from the unlimited supply in the Indus, rain gives a valuable assistance if it happens to supplement the canal supply when the river falls: but it does more harm than good with a high and steady inundation.

3. In point of importance and geographical position the Kashmor bund in Upper Sind Frontier is the leading one, and it is satisfactory to note that beyond a few leaks, which were promptly closed, nothing occurred to cause anxiety as to the stability of that work. On some of the other protective embankments, however, there was considerable strain when the river was at its highest; also at points exposed to the erosive action of the river breaches occurred and loop lines had to be constructed, as for instance in the Ghár Canals districts. In others a number of leaks occurred, two of which, one in the Sukkur-Begári bund and the other in the lower reaches of the line of bunds known as the left bank bunds in the Karáchi Collectorate, turned into breaches: but fortunately these caused little damage since they occurred late in the season and were quickly closed.

4. The next danger to the safety of the protective embankments arose from a totally different source. Two cyclonic storms passed over the Jháli bund new loop, which had been constructed during the working season as a measure of precaution. The first storm occurred on the 17th July and carried away every single landhi and shed for some miles along the embankment: it lifted the corrugated iron roof of the Ruk Station of the Indus Valley State Railway clear off, and carried away the top 4 feet walling to which the roof was tied down, and did other damage. The second storm occurred thirteen days later on: during this storm the wind and waves tore up the matting protecting the face of the new loop near the 5th mile, and before sufficient labour could be obtained a

breach was made: but as the old embankment fortunately was still intact very little damage was done, the flood being limited to the quantity of water between the two embankments. Happily these storms did not extend to other embankments. Lastly, in consequence of an excessive head of water there were several breaches in certain canals damaging to cultivation on them to some extent, as for instance in the Ghár Canal. The storms described above had nothing to do with these breaches.

5. So much as to the inundation and rainfall and accidents. Next as to the outturn on the irrigation operations of the year under both the agricultural seasons, and the irrigation share of net consolidated assessment thereon, *i. e.* less remissions and land share: the particulars may be gathered from the following table, in which are also exhibited the results of 5 previous years by way of comparison:—

TABLE A.

Years.	Area of Cultivation.			Irrigation share of net Consolidated Assessment.
	Kharíf.	Rabi.	Total.	
	Acres.	Acres.	Acres.	Rs.
1879-80	1,114,510	228,243	1,342,753	27,72,085
1880-81	1,172,384	156,278	1,328,662	28,43,067
1881-82	1,260,108	158,821	1,418,929	32,28,947
1882-83	1,281,691	226,601	1,508,292	32,02,048
1883-84	1,197,513	164,594	1,362,107	31,68,358
Average...	1,205,241	186,907	1,392,148	30,42,901
1884-85	1,353,960	232,319	1,586,279	36,16,370
Difference	+148,719	+45,412	+194,131	+5,73,469

The result for the year as compared with the average of five previous years is apparent in this table. It may be well however to examine the result of the year as compared with that of the preceding one. There was an increase in the area of kharíf and rabi of 156,447 and 67,725 acres respectively, or in the aggregate 224,172 acres, and an increase of Rs. 4,48,012 in the irrigation share of net consolidated assessments. The results in both cases, that is by comparison with the average of 5 previous years and with the preceding one, are most satisfactory, and in fact the success eclipses all previous Sind records. It will be necessary to explain the causes which led to such a result: but before doing so it may be interesting to show in a tabulated form the increase in the areas of cultivation and the revenue of 1884-85 for each executive district in the Province as compared with the previous year:—

TABLE B.

Executive Districts.	1883-84.		1884-85.		Results.	
	Cultivation, Kharif and Rabi.	Irrigation Share of net Consolidated Assessment.	Cultivation, Kharif and Rabi.	Irrigation Share of net Consolidated Assessment.	Cultivation, Kharif and Rabi.	Irrigation Share of net Consolidated Assessment.
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
Begári Canals	162,914	2,95,175	210,608	3,76,829	+47,694	+81,654
Shikárpur Canals	87,180	2,09,065	118,433	2,64,978	+31,253	+55,913
Ghár Canals	363,502	11,09,136	428,122	12,61,668	+64,620	+152,532
Eastern Nára Canals	92,582	1,63,660	109,490	2,03,157	+16,908	+39,497
Hyderabad Canals...	265,717	5,30,898	303,638	6,04,356	+37,921	+73,458
Fuleli Canals	178,977	3,99,989	183,172	3,72,799	+ 4,195	-27,190
Karáchi Canals	211,235	4,60,435	232,816	5,32,583	+21,581	+72,148
Total ...	1,362,107	31,68,358	1,586,279	36,16,370	+2,24,172	+4,48,012

The increase in all the districts but one, namely Eastern Nára, was due, 1st, to the fairly favourable nature of the inundation and consequent increase of cultivation; 2ndly, to the better clearances to, and improvements of, canals and extension of protective embankments carried out with the help of increased grants; and 3rdly, in many cases to enhanced rates levied under revision and other forms of settlements current in certain tálukas of the Province. In a few cases, for instance in the Guni and Mirpur Batoro Tálukas, the new settlement being in its second year has acted prejudicially, and this it appears is often the case. The increase in the Eastern Nára districts, where settlement has not yet been introduced, is due entirely to increase of cultivation in lands protected by the new embankments along the Thar and Mithrao Canals, the former completed and the latter in progress at the beginning of the year of report. The decrease of Rs. 27,190 in the revenue in respect of the Fuleli Canals district is difficult to account for, as it is not apparent how there could have been any decrease at all when the area of cultivation during the year was in excess of the preceding one by 4,195 acres. If there is any cause for such a remarkable result the Irrigation Department is not aware of it, and in the absence of information the decrease must be attributed to errors in detail of assessment. Enquiries have been instituted. It may be asserted that the period of transition has arrived and that the canal revenue of the Province will go on increasing as the cultivators gain confidence in the certainty of their water supply, backed by immunity from floods: as regards the latter, something yet remains to be done for them by Government as well as in the improvement of canals. The immediate returns shown during the year under report on fresh outlay is most encouraging and shows that if judiciously continued side by side with opening up the country by roads and tramways the Province of Sind will be but little, if at all, inferior in productive capacity to most districts in India, though liable of course to loss of revenue occasionally through accidental causes such as plagues of insects and rats: both these did some damage during 1884-85. The instability of the river's course is however the chief cause for watchful anxiety.

7. There can be no doubt as to the importance of settlements as bearing on the financial success of the irrigation works of the Province in tálukas in which they have already been introduced. There are still ten tálukas, besides the Thar and Párkar district, in which settlements have not yet been introduced: they are noted below in order to show how much may yet be anticipated:—

Upper Sind Frontier.	*Hyderabad Collectorate.*
Kashmor Táluka.	Hyderabad Táluka.
	Badin Táluka.
	Tando Bágo Táluka.
Shikárpur Collectorate.	*Karáchi Táluka.*
Ubauro Táluka.	Sákro Táluka.
	Ghorábári Táluka.
Mirpur Máthelo Táluka.	Sháhbandar Táluka.
	Jati Táluka.

8. The Kashmor Táluka would have been settled long ago but for certain objections on political grounds. As however the northern half of the neighbouring táluka, namely Thul, has recently been brought under settlement these objections probably exist no longer, so that it may come under measurement during the field season of 1886-87. The Ubauro, Mirpur Máthelo, Badin, and Jati Tálukas will be taken in hand for survey operations during the current working season 1885-86 so as to have effect given from 1886-87. Proposals for the Hyderabad Táluka have been submitted and are awaiting sanction. The Tando Bágo, Sháhbandar, Ghorábári, and Sákro Tálukas during the next field season with effect from 1887-88. The lands in the Nára valley, as forming the Thar and Párkar district, will be taken up and completed before the officers of the Sind Revenue Survey close their labours in the Province for good, as has recently been ordered by Government. Speaking of settlements generally, it may be remarked that temporary settlements seem preferable, as the system, by which the occupants pay on the area cultivated and not as in fixed settlements

on the area occupied, is beneficial to the zamindárs, and that the result to Government, in a financial point of view, is satisfactory.

9. The net canal revenue, that is the irrigation share of net consolidated assessment, plus hakaba and miscellaneous receipts for the several irrigation charges in the Province are given in the following table as also the results for 5 previous years :—

TABLE C.

Years.	Begári Canals.	Shikárpur Canals.	Ghár Canals.	Eastern Nára Canals.	Hyderabad Canals.	Fuleli Canals.	Karáchi Canals.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1879-80 ...	2,13,335	1,95,758	8,45,700	1,68,021	6,09,553	3,73,810	4,47,060	28,53,207
1880-81 ...	1,91,186	2,01,920	8,52,004	2,08,468	5,66,958	3,82,634	5,40,862	29,44,032
1881-82 ...	2,65,078	2,40,293	10,99,398	1,75,404	5,94,086	4,03,576	5,67,906	33,45,741
1882-83 ...	3,59,321	2,33,721	11,89,426	1,42,283	5,91,206	3,64,535	4,58,352	33,38,844
1883-84 ...	3,41,953	2,12,270	11,23,953	1,85,596	5,48,060	4,21,324	4,73,896	33,07,052
Average ...	2,71,176	2,16,792	10,22,096	1,75,954	5,81,967	3,89,176	4,97,615	31,57,775
1884-85 ...	4,40,198	2,70,080	12,79,629	2,21,203	6,20,269	3,94,915	5,46,872	37,73,166
Difference ...	+1,69,022	+53,288	+2,57,533	+45,249	+38,302	+5,739	+49,257	+6,15,391

The results exhibited in this table, as well as those shown in Tables A. and B., are most satisfactory, the total for the Province for each year in the last column very clearly indicating the satisfactory aspect matters are taking: how steady and progressive has been the development of the canal revenue up to 1883-84 and how rapid and great the result for the year of report. As the increased returns under head irrigation share has already been explained in a previous paragraph, it is only necessary to make a few observations in regard to hakaba and miscellaneous receipts which, as stated above, are included in the figures in the above table. But before going into these details an estimate drawn up by the Superintending Engineer for Irrigation in Sind and submitted to Government nearly three years ago of the probable areas of cultivation and canal revenue of Sind by 1886-87 may be adverted to briefly, and a consideration of circumstances, present and prospective, will show how well justified was the application for a permanent increase to the maintenance and repair grant for the Province then made. This estimate is noted below, as well as the results for 1884-85, with a view to show what progress has been made towards attaining the maximum results then anticipated :—

TABLE D.

	Government Land.			Jághir.	Grand Total.	Net Canal Revenue.			
	Kharif.	Rabi.	Total.			Irrigation Share of net Consolidated Assessment.	Hakaba.	Miscellaneous.	Total.
	Acres.	Acres.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Results anticipated by 1886-87	1,450,000	200,000	1,650,000	226,000	1,876,000	40,50,000	1,40,000	42,000	42,32,000
Results attained in 1884-85 ..	1,353,960	232,319	1,586,279	196,894	1,783,173	36,16,370	1,06,090	50,706	37,73,166
To be attained.. .. .	−96,040	+32,319	−63,721	−29,106	−92,827	−4,33,630	−33,910	+8,706	−4,58,834

10. The estimate under rabi has been reached, and taking credit for the increase under that head, namely 32,319 acres, only 63,721 acres are wanting. So also under net canal revenue the estimate as regards miscellaneous receipts has been reached, and taking credit for the increase under this head, namely Rs. 8,706, Rs. 4,58,834 are still required. Taking into consideration the increase which will accrue from the levy of enhanced rates on lands in tálukas in which settlements have yet to be introduced, and bearing in mind the tendency on the part of the cultivators to extend their cultivation under the present improved state of affairs, as well as the large areas of fresh land which will come under cultivation when the Unharwah and the new Edenwah branch of the Begári canal in the Frontier district and the Seharwah in the Rohri district (taken over and restored during the year of report) are fully worked, the probabilities are that the net canal revenue of the Province will reach a higher limit than that anticipated in the estimate alluded to. The Unharwah, commenced in

December 1884, has been completed, and applications for 83,250 acres were received up to March last, and probably others have since been received for more. The new Edenwah branch is to provide a supply of water for Deh Sir Amani, in which there is over 1 lákh of acres of virgin soil: this and the Seharwah have also been completed and application for land to the extent of 51,000 and 12,000 acres respectively have been received. Taking these at least as the areas which will come under cultivation the addition to the canal revenue of the Province from these three canals alone at the end of 1885-86, at average rates in force in the Desert and Begári Canals and canals in Rohri, will be Rs. 2,95,500, or nearly ⅔rds of the sum required to make up the estimate in Table D. for 1886-87. The Eastern Nára and other canals will easily add the remaining third (barring accidents.)

11. To return to details under hakaba on jághírs and miscellaneous receipts: the former will be sufficiently explained by the figures in Table E. and the latter need only a few words of explanation. There was an increase of Rs. 2,854 as compared with the receipts for the previous year: the bulk of this increase comes from the Eastern Nára canals as the receipts there have been considerably over those in other districts, namely Rs. 17,347. The details under this head are given in Table III. (Appendix).

TABLE E.

Districts.	Area of cultivation during year.	Unrealized Balance at end of year.	Assessment of the year.		Total.	Remissions during year.	Net Total realizable.	Actual Realizations during year.	Balance unrealized at end of year.
			Area.	Assessment.					
	Acres.	Rs.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Khelat	69,574	95,174	69,574	70,454	1,65,628	...	1,65,628	60,549	1,05,079
Upper Sind Frontier.	553	336	553	244	580	...	580	392	188
Shikárpur	24,029	4,012	24,029	9,336	13,348	347	13,001	8,976	4,025
Thar and Párkar ...	928	...	928	452	452	...	452	452	...
Hyderabad	83,809	19,798	442,192	31,779	51,577	...	51,577	31,397	20,180
Karáchi	18,004	1,058	18,004	4,372	5,430	...	5,430	4,324	1,106
1884-85	196,897	1,20,378	555,280	1,16,637	2,73,015	347	2,36,668	1,06,090	1,30,578
1883-84	178,724	94,473	279,140	1,13,119	2,07,592	2,084	2,05,508	85,130	1,20,378
Difference... ...	+18,173	+25,905	+276,140	+3,518	+29,423	—1,737	+31,160	+20,90	+10,200

12. The result under area cultivated during the year is satisfactory as compared with the previous year: but the result under head actual realizations is very unsatisfactory, since out of the net total realizable of Rs. 2,36,668 only Rs. 1,06,090, or considerably less than one-half, have been recovered, leaving as large an outstanding balance at the end of the year as Rs. 1,30,578. The largest outstanding is that noted against Khelat. The outstandings against Shikárpur and Hyderabad are nearly ½ of the amount due for collection: but as every endeavour has been made by the authorities concerned to reduce the outstandings to a minimum there was apparently no help for it. The area noted against Hyderabad under head assessment of the year is a very questionable one, for if the net total realizable at the end of the year were only Rs. 51,577, it is difficult to conceive how the area could be so much as 442,192 acres, the money value of which ought certainly to be much more than that represented. There is apparently some error in this.

13. The direct and indirect receipts of canal revenue are shown in Tables VI. and VI.—A. (Appendix), the figures in the former representing the irrigation share of net assessed revenue and those in the latter actual collection. In both the tables hakaba and miscellaneous receipts, which are actual collections, are recorded.

14. The following table shows the total for collection, actual realizations, balance outstanding, and the irrigation share of collection for the year as furnished in Canal Return VIII.—A. by the Revenue Department:—

TABLE F.

Districts.	Total for collection.	Actual realization.	Balance outstanding.	Irrigation share of collection.
	Rs.	Rs.	Rs.	Rs.
Upper Sind Frontier	4,89,922	4,44,560	45,362	4,00,104
Shikárpur	17,55,768	17,16,258	39,510	15,44,632
Thar and Párkar	2,14,425	2,14,068	357	1,92,661
Hyderabad	12,18,294	11,38,161	80,133	10,24,345
Karáchi	6,34,069	5,91,199	42,870	5,32,079
Total ...	43,12,478	41,04,246	2,08,232	36,93,821

The outstandings of each district, if considered individually, are not very heavy: but if considered as a whole the case is different. There is however an improvement on the previous year, when out of a total for collection of Rs. 38,36,882 only Rs. 34,58,321 were recovered, leaving Rs. 3,78,561 outstanding: whereas out of a larger sum for collection in the year of report the outstanding for the Province is only Rs. 2,08,232, the recoveries, generally speaking, having been made without much difficulty and with little resort to legal measures, showing probably that the pecuniary condition of the people is improving and promises still better results as this improvement becomes more decided and the habits of the people become more thrifty and business-like when prosperity is secured to them by efficient canals and protective embankments and good markets for produce.

15. The areas of kharif and rabi and the net consolidated assessments, as also the irrigation and land shares, are shown in Table VII. (Appendix). The figures are those furnished in Canal Return VIII. by the Revenue Department.

16. The remissions for 6 previous years and for the year of report are given in the following table for each executive district:—

TABLE G.

Executive District.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	Average.	1884-85.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	899	213	1,955	...	...	4,685	1,292	3,376
Shikárpur Canals	16,859	691	1,415	58	842	6,814	4,446	369
Ghár Canals	82,061	4,214	12,198	9,268	66,818	17,312	31,978	27,585
Eastern Nára Canals	1,08,987	1,762	2,928	2,504	13,476	910	21,761	267
Hyderabad Canals	23,384	58,005	20,216	911	18,817	493	20,304	60,391
Fuleli Canals	61,308	929	2,622	2,917	5,248	1,036	12,344	3,246
Karáchi Canals	48,205	32,159	23,423	19,194	1,06,505	61,621	48,518	16,814
Total ...	3,41,703	97,973	64,757	34,852	211,706	92,871	1,40,648	1,12,048

The remissions for the year, although well within the average of 6 previous years, are heavy: but it is satisfactory to note that they are not wholly attributable to damages to crops by breaches in flood embankments and canal banks but also to outside causes, such for instance as blight, ravages by rats, and so forth. More than one-half of the total remissions for the Province are shown against canals in the Hyderabad Canals district, but the greater part of these remissions were granted for lands which were left uncultivated and which, according to fallow rules, ought to have been cultivated.

17. The revenue expenditure, that is the expenditure on maintenance and repairs including Public Works establishment and revenue collection charges in

the Revenue Department, is shown in detail in Table IV. (Appendix). The figures in Table H. are the abstract of expenditure under these heads for the whole Province for six previous years and for the year of report.

TABLE H.

Years.	Maintenance and Repairs.			Revenue Collection Charges.	Total.
	Works.	Establishment.	Total.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1878-79	6,20,312	2,34,109	8,54,421	2,54,089	11,08,510
1879-80	6,87,162	2,38,070	9,25,232	2,38,744	11,63,976
1880-81	7,32,956	2,07,752	9,40,708	2,48,897	11,89,605
1881-82	8,86,044	2,12,897	10,98,941	2,74,070	13,73,011
1882-83	8,68,991	2,22,036	10,91,027	2,72,652	13,63,679
1883-84	8,78,816	2,14,128	10,92,944	2,74,762	13,67,706
Average	7,79,047	2,21,498	10,00,545	2,60,536	12,61,081
1884-85	8,53,757	2,13,717	10,67,474	3,36,613	14,04,087
Difference	+74,710	—7,781	+66,929	+76,077	+1,43,006

The expenditure for the year under head works, which is for all classes of works in the Province, although less than the preceding year by Rs. 25,059, is more than the average of 6 previous years by Rs. 74,710 : the grant for the year, however, was Rs. 8,69,509 ; but as the extra grant made available came rather late in the year it was found impossible to expend it to the fullest extent, so that a sum of Rs. 25,059, as noted above, either lapsed or had to be reappropriated for new works, and this part will repay itself at once : but it was a pity it could not go for its proper object.

18. In addition to the expenditure recorded in the above table a sum of Rs. 1,51,847 was expended on extensions and improvements, and Rs. 31,040 on establishment, so that the total revenue expenditure for the year was, on—

	Rs.	Rs.
Extensions and Improvements	1,51,847	
Maintenance and Repairs	8,53,757	
		10,05,604
Establishment, Public Works Department...	2,44,757	
,, Revenue Department ...	3,36,613	
		5,81,370
	Total Rs.	15,86,974

The item of Rs. 1,51,847 includes an expenditure of Rs. 25,134 on the Seharwah in the Rohri districts referred to in para. 10 *ante*, and Rs. 5,712 on sluices to forest canals in the Shâhbandar districts. The former has been included under canals in Rohri, and the latter has been shown separately below the canals in the Karâchi Canals district in Table IV. (Appendix) as it is an agricultural work for which neither Capital nor Revenue Accounts are kept. The Establishment charges in the Revenue Department for the past year were Rs. 2,74,762, while the charges for the year of report were, as noted above, Rs. 3,36,613 : the excess is due apparently to the collection for the year being greater than the preceding one.

19. The percentage of expenditure on revenue and the cost of maintenance per acre for 6 previous years and for the year of report were as below :—

TABLE I.

Years.	Cultivation.	Net Canal Revenue.	Maintenance and Repairs and Revenue Collection.	Percentage of Expenditure on Revenue.	Cost of maintenance per Acre.
	Acres.	Rs.	Rs.	Rs.	Rs.
1878-79	2,016,089	30,40,434	11,08,510	36·46	·55
1879-80	1,454,028	28,53,207	11,63,976	40·80	·80
1880-81	1,492,669	29,44,032	11,89,605	40·41	·79
1881-82	1,601,986	33,45,741	13,73,011	41·04	·86
1882-83	1,673,293	33,38,844	13,63,679	40·84	·82
1883-84	1,540,831	33,07,052	13,67,706	41·36	·88
Average	1,629,816	31,38,218	12,61,081	40·15	·78
1884-85	1,783,173	37,73,166	14,04,087	37·21	·79

The percentage of expenditure on revenue compared with the preceding year and the average of 6 previous ones is favourable, and the cost of maintenance per acre is much less than the previous year, and only a trifle more than the average.

20. The percentages of cost of Public Works Establishment on the expenditure incurred on maintenance and repairs for each executive charge in the Province for the year of report and for the preceding one are given below :—

	1884-85.	1883-84.
Begári Canals	26·02	27·74
Shikárpur Canals	11·72	15·15
Ghár Canals	20·47	19·65
Eastern Nára Canals	46·74	28·46
Hyderabad Canals	24·19	27·57
Fuleli Canals	26·46	27·80
Karáchi Canals	28·93	24·74
For the Province ...	25·03	24·37

The increase in the percentages for the Ghár and Karáchi Canals is not much and does not therefore call for remark : but the increase in the percentage for the Eastern Nára Canals is great. It was due to the total establishment charges for the year being greater than those of the preceding year owing to charges for temporary measuring establishment being debited to head establishment instead of to maintenance and repairs as heretofore. The percentage for the Province is only a little more than that of the previous year.

21. There was during the year an addition of 94 and 19 miles to the mileage of canals and bunds respectively in the Province as below :—

	Canals.	Bunds.
Seharwah	28	...
Shahjokur } branches of Ghar ... {	34	...
Datajokur }	30	...
Magsi Bund (new)	...	4
Eastern Nára bunds	...	1
Mithrao Canal Protective Embankment	...	13
Nasirwah	2	...
Great Márak	...	1
	94	19

The first three canals were taken over and brought on the list of Government canals during the year. The mileage of canals and bunds in the Province are given in Table V. (Appendix). The mileage of left bank bunds in the Karáchi Canals district has been altered from 55, as shown in last year's report, to 65 miles in the report for the year, as this is the correct length as completed.

22. The irrigating duty per cubic foot of supply for some of the canals is shown in Table VIII. (Appendix), and as remarks on this subject will be made further on when the operations of the several canals are treated separately it is unnecessary to make any remarks here.

23. The general abstract of financial results of the irrigation works in the Province for and up to the close of the year of report is appended, and the results recorded there are summed up in the following table :—

TABLE J.

Class of Works.	Gross Revenue.	Working Expenses.	Net Revenue.	Simple Interest.	Net Profit.
	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Public Works ...	6,28,477	2,16,713	4,11,764	2,74,172	1,37,592
Ordinary Irrigation and Navigation Works for which Capital and Revenue Accounts are kept	10,39,164	4,91,846	5,47,318	...	5,47,318
Do. do. for which only Revenue Accounts are kept...	17,71,728	8,37,165	9,34,563	...	9,34,563
1884-85	34,39,369	15,45,724	18,93,645	2,74,172	16,19,473
1883-84	28,06,517	14,58,228	13,48,289	2,52,707	10,95,582
Difference	+6,32,852	+87,496	+5,45,356	21,465	+5,23,891

The results under all heads save working expenses are favourable. The interest charges for the last two classes of works have been omitted, as last year, under orders of the Government of India.

24. The amount of loss to certain canals on account of difference between the assessment of water rates on jághir lands and the assessment at rates in force for Government lands is given in the memorandum attached to the general abstract of financial results in detail for capital works, and in lump for other class of works : the details may be obtained from Tables VI. and VI.A. (Appendix). The total loss to the canals for the jághir area irrigated was Rs. 3,18,703 or Rs. 70,124 more than that of the previous year.

FRONTIER, UPPER SIND.

Begári Canals.

25. The inundation was noticed by the Executive Engineer, Begári Canals, to have been a lower one than that of 1883, but of longer duration and greater steadiness as experienced in the Begári Canals district and as recorded at Bukkur gauge, but not so as indicated by readings from the Dehra Gházi Khán gauge. This was due doubtless to Sutlej floods entering the Indus far below Dehra Gházi Khán. It may here be incidentally noticed that in consequence of a sudden flood on the 15th January 1885, which raised the river from 1 to 7′ at Bukkur, considerable damage was done to temporary bunds at mouths of canals in Sind : this, together with the consideration that the Dehra Gházi Khán gauge is not a sufficient index of Indus floods below the mouth of the Sutlej, led to arrangements being made for reports from gauge stations on each large feeder of the Indus being sent to Sukkur throughout the monsoon and at every sudden flood throughout the year, and for each Executive Engineer to have them in future in codified form from the Executive Engineer, Shikárpur Canals.

Desert Canal.

26. During the working season of 1883-84 the pavement of the Head Regulator was lowered 2 feet and the canal deepened to the same extent, reducing the bed gradient below this from 8″ to 7·46″ per mile, meeting the old gradient at mile 16. The inundation was rather unsteady at the Head Regulator, due apparently to the river taking the opposite bank at the mouth of the dhand which acts as a feeder to this canal. On account of the deepening, the extra amount of water

passing down begins to be felt on the Drakhan gauge, the mean height there during the season being 9·86 against 8·09 in 1883 and 8·65 in 1882. The canal was opened on the 25th May and on the 10th June the down stream gauge at Head Regulator read 6·75. During the working season of 1883-84 the bed of the Muradwah branch of the Desert Canal was also cleared to the same depth as the Head Regulator, *viz.* 1·35′ lower than last year's bed. Several breaches occurred on this as well as on the Desert Canal proper. They were closed promptly and effectively. The crops along the former did not suffer; those along the latter did to some extent.

27. The areas of kharif and rabi on the Desert Canal and on its branch, the Muradwah, as well as on land in Khelat, and the assessed revenue thereon for the year of report and for the preceding one are shown in the following table:—

Years.	Cultivation.			Assessed Revenue.			Remissions.	Net assessed revenue.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.		
Desert Canal.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	39,857	3,155	43,012	77,142	5,035	82,177	...	82,177
1884-85	51,473	7,301	58,774	1,00,284	13,929	1,14,213	1,946	1,12,267
Difference	+11,616	+4,146	+15,762	+23,142	+8,894	+32,036	+1,946	+30,090
Muradwah.								
1883-84	10,222	2,256	12,478	20,654	4,214	24,868	...	24,868
1884-85	11,704	3,931	15,635	23,425	7,816	31,241	...	31,241
Difference	+1,482	+1,675	+3,157	+2,771	+3,602	+6,373	...	+6,373
Land in Khelat.								
1883-84	25,128	3,309	28,437	28,083	3,309	31,392	...	31,392
1884-85	29,118	3,783	32,901	29,490	4,002	33,492	...	33,492
Difference	+3,990	+474	+4,464	+1,407	+693	+2,100	...	+2,100

On the Desert Canal there was an increase of 15,762 acres of cultivation under both kharif and rabi, and an increase in net assessment of Rs. 30,090. On the Muradwah an increase of 3,157 acres and an increase in net assessment of Rs. 6,373. The principal causes of these increases are due to the excellent supply of water, some of the minor causes being the withdrawal of restrictions in regard to clearing fields of jungle in certain parts, new surveys in certain tálukas, and a careful check on the measurements by the Revenue authorities. The increase in Khelat is 4,464 acres of cultivation and Rs. 2,100 of net assessment. These results were communicated in Canal Return IX., but in the statement showing produce of crops subsequently received the Political Agent, Jacobabad, shows 52,598 as the actual area cultivated; and on enquiries being made that officer has explained that the figures in the canal return are obtained by estimating one-third only of the lands on 7 years' lease as being cultivated. The estimate, he states, is made whether the actual area of cultivation be more or less than $\frac{1}{3}$ of the lease, so it appears that the Irrigation Department supplied water for 52,598 acres and got paid for only 39,712 acres. The remission of Rs. 1,946 on the Desert Canal was given owing to non-germination of the sariah seed (Sinapis glauca) during the rabi season.

28. The charges on account of maintenance and repairs during the year including the Muradwah were Rs. 31,486, which includes Rs. 8,328 for establishment and tools and plant: the cost of revenue collection was Rs. 12,063 and the total charges against revenue were Rs. 43,549. The percentage of expenditure on revenue was 27·59 and the cost of maintenance per acre ·40. The net revenue realized during the year was Rs. 1,04,406 against Rs. 79,355 of the preceding one; the interest charges for the year were Rs. 41,748 and the net profit Rs. 62,658; the balance of net profit to the end of the year was Rs. 4,92,113. The loss on account of hakaba on land in Khelat and jághirs in Upper Sind Frontier was Rs. 27,090.

29. The average discharge of the Desert Canal proper from the 10th June to the 25th September was 1,581 cubic feet per second against 1,149, or an increase of 432 cubic feet per second over that of the previous year. The duty of water for 1883-84 was 74·22 acres per cubic foot per second; the inundation of that year having been in the higher reaches of the canal lower than in 1882 and not of such long duration, more advantage was taken of the water, and the duty therefore per cubic foot per second is rather high. The average discharge of the Muradwah was 385 against 308 of the previous year. The kharif area irrigated on the Desert Canal and the Muradwah was 95,440 and 11,710 acres respectively, exclusive of 19,011 and 3,942 acres flooded during the season for rabi.

Begari Canal.

30. The inundation of 1884 was the best on record for this canal, its gauge readings from the 15th June to 25th September proving beyond doubt its steady character: 2·50 feet of water was admitted for the supply of the Railway tanks at Jacobabad and Jatpat on 1st May, the up-stream gauge reading 5·90 feet. As very few zamindárs kurriahs were opened before the 15th June full supply was not admitted, as with 6·00 feet on the down-stream gauge Head Regulator three breaches occurred in the lower reaches of the canal, the gauge at Khaira Garhi reading 8·30 feet or 1·02 feet above full supply. In the branches of the Begári also the supply was abundant throughout the year, rendering the fixing of needles across the main canal, as last year, unnecessary.

31. The result of the season's operations as compared with those of the previous year is given in the following table:—

Years.	Cultivation.			Assessed Revenue.			Remissions.	Net assessed Revenue.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total		
Frontier Districts.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	89,472	2,165	91,637	1,81,757	3,805	1,85,562	4,265	1,81,297
1884-85	96,258	16,865	113,123	1,89,998	29,441	2,19,439	1,430	2,18,009
Difference...	+6,786	+14,700	+21,486	+8,241	+25,636	+33,877	−2,835	+36,712
Shikárpur.								
1883-84	13,627	38	13,665	35,692	131	35,823	420	35,403
1884-85	18,596	496	19,092	47,476	1,752	49,228	...	49,228
Difference...	+4,969	+458	+5,427	+11,784	+1,621	+13,405	−420	+13,825
Khelat.								
1883-84	36,942	209	37,151	37,888	212	38,100	...	38,100
1884-85	34,607	2,066	36,673	34,766	2,195	36,961	...	36,961
Difference...	−2,335	+1,857	−478	−3,122	+1,983	−1,139	...	−1,139

The increase on the Begári in the Frontier district was 21,486 acres of cultivation and a net assessed revenue of Rs. 36,712. The increase in the Begári running past the Shikárpur district was 5,427 acres and a net assessed revenue of Rs. 13,825, the aggregate increase for both the districts being 26,913 acres and Rs. 50,537 net assessed revenue. These results are satisfactory, and are due to the excellent supply of water and the working of settlements in certain tálukas through which the canal runs past. The remission of Rs. 1,430 was given on account of non-germination of seria seed during rabi as in the case of the Desert Canal. The result on land in Khelat is very unsatisfactory, but the actual area cultivated according to statement of crops appears to have been 38,973, and the reason why this area and the assessment thereon have not been shown is due to the same cause as explained in para. 27 *ante*, in regard to Khelat land watered by the Desert Canal. In sending up Canal Return IX. the Political Agent, Jacobabad, has reported that remissions to the extent of Rs. 13,559 have been recommended for sanction to the Agent Governor General, Beluchistán; and if this be sanctioned the result will be a most unsatisfactory one.

32. The charges on account of maintenance and repairs were Rs. 58,350, including Rs. 13,669 for establishment and tools and plant: the cost of revenue

collection was Rs. 22,835 and the total revenue expenditure Rs. 81,185. The percentage of expenditure on revenue was 29·51 and the cost of maintenance per acre ·46. The net revenue realized during the year was Rs. 1,78,202, the interest charges Rs. 60,602, the net profit for the year Rs. 1,17,600, and the balance of net revenue to the end of the year Rs. 5,14,728. The loss to Government on account of lands in Khelat and jághirs in British territory was Rs. 41,709.

33. The average discharge of the Begári from the 10th June to 25th September was 4,298 cubic feet per second against 3,153 in the previous year. The area irrigated during the kharif season was 157,372 which includes jághir land in the Frontier and Shikárpur districts: an area of 25,057 was flooded during the season for rabi.

Kashmor Bund.

34. Further than the ordinary eating away of the banks little change in the river has taken place as affecting the bund. At the mouth of the Desert Canal a dhand is now flowing and the river has taken to the opposite bank. Opposite mile 40 of the bund a strong current set in against the bank, but it did not act prejudicially as the river subsided soon after. From this to Chandur the river has again returned to the high bank, having scoured away the silt deposited in the previous year. From Chandur to the new cut made in 1883 little change has taken place. The groyne at Chandur has worked very well, the pitching put on during the working season showing no signs of injury. A number of leaks occurred chiefly at the roots of trees, and these were detected at once, cut out and re-filled before any material damage occurring.

35. The trees in front of the bund, particularly the bábul (Acacia arabica), have reached a good height and afford plentiful shade during the hot weather, but the roots spreading transversely in the front slope are a source of danger and will have to be cut down. Fruit and other trees have been planted and are doing well: they have been brought up from seeds sown in the garden at Badani.

36. The expenditure on maintenance and repairs and conservancy of the bund, maintenance of the garden at Badani, the rent of the telegraph office there during the inundation season, and the maintenance of the Bakshaliwah, was Rs. 38,786; the expenditure on establishment and tools and plant Rs. 5,748 and the cost of revenue collection Rs. 517: total charges being Rs. 45,250, and the net receipts Rs. 7,316.

SHIKÁRPUR CANALS.

37. The canals in this district worked well, the result being a considerable increase over the area and assessment of the previous year as will be seen from the following figures in the case of the canals as well as the bunds in Rohri.

CANALS IN ROHRI.

Years.	Cultivation.			Assessed Revenue.			Remissions.	Net Assessed Revenue.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.		
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	33,171	10,520	43,691	86,946	28,933	1,15,879	2,110	1,13,769
1884-85	46,642	21,593	68,235	1,07,947	46,680	1,54,627	356	1,54,271
Difference ...	+13,471	+11,073	+24,544	+21,001	+17,747	+38,748	−1,754	+40,502
BUNDS IN ROHRI.								
1883-84	1,740	565	2,305	6,128	2,087	8,215	2,427	5,788
1884-85	3,207	770	3,977	6,791	1,531	8,322	...	8,322
Difference ...	+1,467	+205	+1,672	+663	+556	+107	−2,427	+2,534

On the canals in the Rohri districts there was an increase of cultivation to the extent of 24,544 acres and an increase in the net assessment of Rs. 40,502. On the bunds in Rohri there was an increase of 1,672 acres of cultivation and an

increase in the net assessment of Rs. 2,534, or in the aggregate under both, 26,216 acres of cultivation and Rs. 43,036 of net assessment. Of this Rs. 38,104 are due to increase of cultivation and Rs. 4,932 to the revision settlement current in the Rohri Táluka. The cause of the increase of cultivation is due to liberal expenditure of funds to put the canals in good order, to the favourable nature of the inundation, sloping tail of the Imamwah to a proper gradient, and to the opening of a new mouth to supply both the Masu and Maharowahs. The assessment of Rs. 1,531 for the rabi area of 770 acres for the year of report is questionable, as in the previous year with only 565 acres the assessment was Rs. 2,087 : but this arbitrary result, it is said, is due to the greater portion of kharíf numbers bearing lighter assessment having been brought under rabi cultivation during the year. The expenditure for maintenance and repairs was, for the canals in Rohri, Rs. 33,697 including establishment and tools and plant, and Rs. 14,099 for revenue collection. On the bunds in Rohri the expenditure under these heads was Rs. 5,168 and Rs. 749 respectively.

Sind Canal.

38. The Sind Canal was opened on the 31st May and worked well. One breach occurred at the 3rd mile and was promptly closed the same day without any damage occurring. The rice crops were fine : but the jovári crops suffered somewhat by being beaten down by rain which fell at the end of August and beginning of September. There were a large number of applications for water for land hitherto uncultivated : but they could not be complied with, the supply being just sufficient for ordinary requirements. When the widening of the mouth, which was taken in hand during the working season of 1884-85 and partially completed at the beginning of the ensuing kharíf season is completed, there will be an ample supply of water, and all applications for water can be complied with.

29. The result of the season's operations as regards the Sind Canal is given in the following table :—

Years.	Cultivation.			Assessed Revenue.			Remissions.	Net Assessed Revenue.
	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Total.		
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	36,856	4,328	41,184	1,06,222	8,792	1,15,014	2,277	1,12,737
1884-85	40,500	5,721	46,221	1,15,719	16,120	1,31,839	13	1,31,826
Difference ...	+3,644	+1,393	+5,037	+9,497	+7,328	+16,825	—2,264	+19,089

The increase in the area of cultivation was 5,037 acres and the increase in the net assessment Rs. 19,089. The cause of the increase was due to the new mouth and to the improvement at the tail of Chota Begári, its branch, and also to the favourable nature of the inundation. When the revision settlement comes into force in 1885-86 the expectations from this canal are great as the levy of enhanced rates on fresh lands as well as existing lands will raise the revenue of the canal considerably. The expenditure on maintenance and repairs, including establishment and tools and plant, was Rs. 13,302, and cost of revenue collection Rs. 12,111.

Sukkur-Begári Bund.

40. There were several leaks through this bund, but were, with one exception, closed before any damage was done. This one occurred on the 16th June at the commencement of the loop which begins 66 feet beyond the 10th mile, and before it could be stopped it had opened out into a breach 50 feet wide and 5 feet deep. Fortunately, however, there was a village which was endangered by the breach so that there was no difficulty in obtaining labour and the breach was closed on the 20th idem without danger either to the crops or the village. Water percolated through the bund along the greater portion of its length, but not to such an extent as to cause anxiety. The expenditure on maintenance and repairs was Rs. 33,022, establishment and tools and plant Rs. 3,751 : total Rs. 35,773 : receipts Rs. 2,534.

GHA'R CANALS.

Sukkur Canal.

41. The Sukkur Canal was opened on the 25th May and the supply throughout the year was good. During the year 13 masonry heads were constructed. The old head was kept open throughout the rabi season and there was not much deposit of silt; during the kharíf season, however, the back water deposited silt in small quantities. The depth of silt at the mouth about the middle of November was over 5', or an increase of 1' 9" for the season. The canal had silted 2' as far as the 18th mile. The revenue results of the canal however have been satisfactory as will be seen from the figures in the following table:—

Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1881-82	63,165	3,139	66,304	1,16,823	3,825	1,20,648	1·91	1·22	1·82
1882-83	56,024	17,259	73,283	1,41,575	29,515	1,71,090	2·53	1·71	2·33
1883-84	46,468	13,162	59,630	1,21,685	31,810	1,53,495	2·62	2·42	2·57
1884-85	53,219	17,838	71,057	1,33,965	47,347	1,81,312	2·52	2·65	2·31

42. The result for the year, as compared with the previous years, is an increase of 11,427 acres of cultivation and Rs. 27,817 of net assessed revenue. This satisfactory result is due to the favourable nature of the inundation and the supply throughout the year having been good. Remissions to the extent of Rs. 1,429 and Rs. 1,820 were given for the kharíf and rabi respectively. Nearly the whole of these remissions were given for causes with which the canal had nothing to do.

43. The expenditure on maintenance and repairs and establishment and tools and plant was Rs. 22,493, cost of revenue collection Rs. 9,789, making a total charge against revenue of Rs. 32,282. The irrigation share of land revenue together with hakaba and miscellaneous receipts came to Rs. 98,294, the balance of net revenue after deducting working expenses was Rs. 65,503. The percentage of expenditure on revenue was 19·71 and the cost of maintenance per acre ·45. The average discharge of the canal was 1,902 cubic feet per second against 1,786 of the previous year. The total kharíf area irrigated was 53,704 acres and the duty 28·23 acres to the cubic foot of supply.

Ghar.

44. The Ghar was flowing throughout the cold weather. At the commencement of the season the bed of the canal was 2' below zero at mouth, but at the end of the season the river altered its course immediately above the mouth and this threw 4' of silt into the canal. The supply however continued unusually good throughout the year, and in consequence there was a great scour. The great point to note this year is the excessive velocity maintained in the canal, when it was 3·40' below full supply level, *i. e.* with 8·60' on the gauge at the mouth a surface velocity of 4·58' per second was gauged. The result was that the canal has widened considerably at all narrow places. There were several breaches, two of which only were serious. They were caused by failure of zamíndári canal heads which were unusually tried owing to an excessive head of canal water near them. The first occurred through a brick and mud built sluice which failed at 10th mile 6th furlong: it was closed on the following day. The second occurred at 16th mile 1st furlong through a canal head protected with brushwood facine: it was closed after 10 days. Notwithstanding these accidents the results are tolerably favourable as will be seen from the figures in the following table:—

Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Total.	Kharíf.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1881-82	182,043	26,223	208,266	5,72,600	55,467	6,28,067	3·14	2·11	3·01
1882-83	207,700	22,565	230,265	6,52,300	72,383	7,24,683	3·14	3·21	3·14
1883-84	170,523	24,262	194,785	6,20,781	89,696	7,10,477	3·64	3·69	3·65
1884-85	182,753	29,821	212,574	6,42,371	1,03,331	7,45,702	3·51	3·46	3·32

45. As compared with the previous year the result is an increase of 17,789 acres of cultivation and an increase of Rs. 35,225 of net consolidated assessment. This satisfactory result is due of course to an extension of cultivation and the favourable nature of the inundation, and also to enhanced rates levied under the revision and other settlements. A sum of Rs. 12,933 was given on account of remissions for the kharif, but it is believed that the whole of this is not due to damages to crops by breaches. A sum of Rs. 1,447 was also given as remissions for the rabi.

46. The expenditure under maintenance and repairs, including establishment and tools and plant, was Rs. 89,641: the cost of revenue collection Rs. 57,717: and the total charges against revenue Rs. 1,47,358. The irrigation share of net assessed revenue, with hakaba and miscellaneous receipts, was Rs. 5,79,642 and the balance of net revenue, after deducting working expenses, Rs. 3,91,179; the percentage of expenditure on revenue was 21·73 and the cost of maintenance per acre ·67. The average discharge of the Ghar was 4,888 cubic feet per second; the total kharif area irrigated was 187,296 acres, and the area irrigated per cubic foot of supply was 38·32.

Western Nára.

47. The Western Nára flowed throughout the cold weather and worked well throughout the year. As in the case of the Ghar, so in this canal there was considerable scour, for although the gauge at mouth read less than in 1883 the height of the gauge at Radhan continued greater during the whole season. No important breaches occurred and almost all were closed by the zemindars nearest them. 57 occurred in all and submerged upwards of 200 acres of land, on some of which remissions had to be given. The excessive rainfall this year brought down the hill floods in the early part of the kharif season and destroyed 5,041 acres of kharif, and it is believed that of the total remissions of Rs. 9,608, upwards of Rs. 7,000 or thereabouts were given for this disaster. During the year an old canal, the Kudawah, that had been closed for years on account of the unsafe condition of its head sluice, was reopened, and about 2,700 acres, it is said, have been brought under cultivation. The results of the Western Nára and its branches are given in the following table:—

Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1881-82	104,976	21,667	126,643	3,56,823	71,002	4,27,825	3·40	3·27	3·38
1882-83	91,636	31,173	122,809	2,58,949	1,16,910	3,75,859	2·82	3·75	3·06
1883-84	73,867	24,651	98,518	2,52,140	88,962	3,41,102	3·41	3·61	3·46
1884-85	104,463	27,429	131,892	3,38,996	1,01,280	4,40,276	3·24	3·69	3·33

48. As compared with the previous year the result is an increase of cultivation to the extent of 33,374 acres and an increase of Rs. 99,174 of net consolidated assessment, which is a very satisfactory and unprecedented result indeed, due to increase of cultivation, working of temporary settlements in certain tálukas, thorough clearance, and to the favourable nature of the inundation. For the kharif and rabi, remissions to the extent of Rs. 9,608 and Rs. 315 respectively have been given. Much of these of course are due to the disaster mentioned above. The cost of maintenance and repairs, including establishment and tools and plant, was Rs. 58,959; cost of revenue collection Rs. 41,967; and the total charge against revenue Rs. 1,00,926. The percentage of expenditure on revenue was 24·87 and the cost of maintenance per acre ·71.

Wahurwah.

49. The Wahurwah worked fairly well, the water rising 3 feet higher than the previous year. The canal has suffered much from encroachments of the river to work well. The area irrigated on this canal under both the agricultural seasons was 8,766 acres and the net assessed revenue Rs. 23,273, against the area and net assessed revenue of the previous year of respectively 7,100 acres and Rs. 17,137; the increase was 1,666 acres of cultivation and Rs. 6,136 of net assessed revenue, which are favourable results. The expenditure on maintenance and repairs,

including establishment and tools and plant, was Rs. 2,183; cost of revenue collection Rs. 2,510; total charges against revenue Rs. 4,693.

Marvi.

50. The last canal in this district which remains to be noticed is the Marvi. It worked satisfactorily, the gauge reading from 2 to 5 feet higher than last year. The river has left the new mouth excavated in 1880-81 and the canal is now supplied from a dhand 4 miles long. The area irrigated on this canal was 3,744 acres and the net assessed revenue Rs. 11,117 against an area and net assessment of 3,446 acres and Rs. 10,056 of the previous year: the increase therefore was 298 acres and Rs. 1,061 of revenue, which is on the whole satisfactory. The expenditure on maintenance and repairs, including establishment and tools and plant, was Rs. 2,252 and cost of revenue collection Rs. 696; total charge against revenue Rs. 2,948.

Right bank bunds.

51. Of right bank bunds the Jhali, Mitho, and Magsi bunds may be said to have met with disasters. First as to Jhali bund; the river threatened to encroach on the embankment between the 4th and 5th miles, and between the 18th mile and Ghar mouth. After an inspection of both places a loop bund was decided upon and constructed. Its length was $2\frac{3}{8}$ miles and at one place 11 feet of water were expected against it. Three large masonry sluices were built through it to provide for existing irrigation. As anticipated, the river continued to encroach steadily, though slowly, during the cold weather, but from the beginning of June the erosion became much more rapid, varying from 100 to 200 feet a week. On the 20th August the river carried away a part of the bund and continued to advance until altogether $\frac{5}{8}$ of a mile was washed away. It is evident from this that had not the loop bund been constructed, a most serious flood would have occurred, extending probably to the Manchar and necessitating remissions to a very considerable extent. On the 13th July the space between the old bund and the new loop was made to fill with water by passing water through existing sluices, so that by the time the river came against the loop it was already well saturated and had been thoroughly tested. The other disasters which happened on this bund were the cyclonic storms described in paragraph 4 of the general review. Next as to the Mitho bund: the river steadily encroached towards this bund throughout the season, and in July a short loop bund behind it was rendered necessary: this was carried out successfully. The river however carried away a part of the bund on the 29th August, at a point 300 feet north of the Fordwah sluice. The Magsi bund is the next to be noticed. This bund was constructed by the zemindars in 1882 and repaired by Government in the following year. The river encroached steadily towards it during the year. On the 17th August a part of it was carried away and was replaced by a loop bund, 1 mile 4 furlongs, which was thrown up by zemindars behind the original bund. The cost of maintenance and repairs, including tools and plant, on the right bank bunds, was Rs. 17,460, and the cost of revenue collection on a small area of cultivation Rs. 16.

THAR AND PARKAR.

Eastern Nára Canals.

52. The canals in this district worked well, the result being an increase in the area and assessment over that of the previous year, as will be seen from the figures in the following table for the whole of the Eastern Nára works for the year under review and for three previous ones:—

Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1881-82	69,002	18,869	87,871	1,43,471	30,965	1,74,436	2·08	1·64	2·00
1882-83	59,389	15,948	75,337	1,09,281	25,946	1,35,227	1·84	1·64	1·79
1883-84	67,161	25,421	92,582	1,40,233	41,612	1,81,845	2·09	1·64	1·96
1884-85	92,818	16,672	109,490	1,96,579	29,151	2,25,730	2·11	1·74	1·96

53. As compared with the previous year the result was an increase in the area and net assessed revenue of 16,908 acres and Rs. 43,885, the remissions being Rs. 267. As compared with the next previous year the result is even greater, and bearing in mind the improved state of affairs it may be confidently asserted that cultivation in the Nára valley will go on increasing rapidly, and in the course of a few years the canal revenue will reach a considerable sum. The expenditure on maintenance and repairs, including establishment and tools and plant, was Rs. 64,879; cost of revenue collection Rs. 21,337; total charges against revenue being Rs. 86,216. The percentage of expenditure on revenue was 38·97 and the cost of maintenance per acre ·77. The net revenue after paying working expenses was Rs. 1,29,156, but deducting interest charges there was a deficit of Rs. 39,034.

Mithrao Canal.

54. The Mithrao Canal was opened on the 16th May and worked well throughout the season, the cultivation on the main canal and branches receiving an ample supply of water. There were no complaints. There were two small breaches, but no damage resulted therefrom. The result of the year's operations is given in the following table:—

Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1881-82	58,991	8,568	67,559	1,20,587	13,821	1,34,408	2·04	1·61	1·99
1882-83	49,825	7,168	56,993	91,094	11,602	1,02,696	1·83	1·62	1·82
1883-84	51,770	13,199	64,969	1,06,967	20,269	1,27,236	2·07	1·54	1·96
1884-85	65,891	7,201	73,092	1,37,596	9,608	1,47,204	2·08	1·33	1·94

55. The result of the year, as compared with that of the previous one, is an increase in the area of cultivation and net assessed revenue of 8,123 acres and Rs. 19,968. This satisfactory result is due to the fact that the rapid extension of the protective embankment along the canal gives confidence to the zemindars holding land north of Samara dhand, and because there was ample water in the canal at the beginning of the season to soften and plough the land. It may be said to be due also to the circumstance that the harvest of 1883-84 having given them a good return, enabled some of the zemindars to pay off their debts, so that for the year under review they were in a position to provide grain for more extensive cultivation, and to the lands having improved from the long immunity from floods.

56. The expenditure on maintenance and repairs, including establishment and tools and plant, was Rs. 31,735; cost of revenue collection Rs. 13,289; total charges against revenue Rs. 45,024. The percentage of expenditure on revenue was 33·67 and the cost of maintenance per acre ·61. The average discharge of the canal during the kharif season was 990 cubic feet per second, and the duty 67·26 acres to the cubic foot.

Thar Canal.

57. The Thar Canal was opened on the 3rd June. There was not sufficient supply during June, partly because of the difficulty of getting water there in time without endangering the Makhi and other bunds, and partly from a desire to avoid a surplus, which would have gone down the Puran and rendered the work of "excavating a channel from head of Thar Canal to the sea" impossible for that season. This work however could not be proceeded with, all the available labour having been concentrated at the Mithrao Canal protective embankment. The canal worked well, the result being an increase in the area and assessment, as will be seen from the following table:—

Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1881-82	4,832	4,467	9,299	10,553	6,597	17,150	2·18	1·47	1·84
1882-83	7,286	1,864	9,150	15,502	2,398	17,900	2·13	1·28	1·95
1883-84	13,003	3,056	16,059	28,749	4,241	32,990	2·21	1·38	2·05
1884-85	20,546	2,630	23,176	45,472	3,918	49,390	2·21	1·48	2·13

58. As compared with the previous year the result is an increase in the area of cultivation and net assessment of 7,117 acres and Rs. 16,400. This satisfactory result is due to the completion of the protective embankment and to the thorough clearance of the canal and its branches. There is every probability of the cultivation increasing every year until the maximum is reached. The expenditure on maintenance and repairs including establishment and tools and plant, was Rs. 19,132; cost of revenue collection Rs. 4,490; total charges against revenue Rs. 23,622. The percentage of expenditure on revenue was 52·41 and the cost of maintenance per acre ·98.

Dimwah.

59. The area irrigated on the Dimwah, under both kharif and rabi, was 1,796 acres, the net assessed revenue being Rs. 3,160 against 1,276 acres, and a net assessed revenue of Rs. 2,113 of the previous year. The cost of maintenance and repairs, including establishment and tools and plant, was Rs. 1,661; cost of revenue collection Rs. 284; total charges against revenue being Rs. 1,945. The percentage of expenditure on revenue was 68·29 and the cost of maintenance per acre 1·08.

Heranwah.

60. The area irrigated on the Heranwah, under both kharif and rabi, was 586 acres and the net assessed revenue Rs. 909 against 225 acres and a net assessed revenue of Rs. 359 of the previous year. The cost of maintenance and repairs, including establishment and tools and plant, was Rs. 128; cost of revenue collection Rs. 82; total charges against revenue being Rs. 210.

HYDERABAD COLLECTORATE.

Hyderabad Canals.

61. All the canals in this district were flowing on the 10th June and all continued to flow till the end of September, a circumstance which goes to prove that the inundation was an exceptionally good one. Taking the main canals in order from the northern part of the district, the Mehrabwah commenced with a fair supply, and as the river rose the supply became more than was required, and much of the excess water was turned on to low lands by which means a large area of rabi crop was grown. The supply in the Nasrat from the commencement of the season was excellent, and lands which have lain waste for years have been brought under cultivation. Of the Naolakhi little need be said beyond that the supply was good and the crops were excellent. The supply in the Dambro and Dadwahs was only fair at the commencement of the season, as the Gharo, which feeds them, silted and did not therefore work well; the river however carried away the silted portions in June and after that the supply was excellent. The Reinwah for the first time drew its supply from the Laka-Nasri dhand; it worked well and gave an ample supply. The Alibhar Kacheri, Marak, Gharo Mahmuda, Sarfraz, and the Kari Shumali also worked well, giving an ample supply for all requirements. On the Nasirwah however there were, at the commencement of the season, complaints as to the supply and it is thought that the bund at the 12th mile had burst; but as this was intact the head was examined and then the cause was traced; the river having changed its course suddenly and setting on the canal mouth had absolutely closed it, having filled it almost in level with the land for upwards of 20 feet. This was removed and an opening made from the Richal dhand. This dhand happening to be well supplied, a fair supply was maintained from it to the end of the season. The result of the year's operations as well as those of three previous ones are given below:—

Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
	Kharif.	Rabi	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1881-82	259,899	17,188	277,087	6,18,970	19,254	6,38,224	2·38	1·12	2·30
1882-83	262,135	30,015	292,150	5,56,760	80,502	6,37,262	2·12	2·68	2·18
1883-84	257,155	8,562	265,717	5,67,794	22,092	5,89,886	2·21	2·58	2·22
1884-85	284,364	19,274	303,638	6,28,461	43,046	6,71,507	2·21	2·23	2·21

62. As compared with the previous year the result is an increase in the area cultivated and net assessed revenue of respectively 37,921 acres and

Rs. 81,621, and this appears to be the first year in which the revenue results of this district reached such a sum as Rs. 6,71,507, and the probabilities are that the cultivation will go on increasing every year as the cultivators are endeavouring to make the most of the present improved state of affairs. During the year remissions to the extent of Rs. 59,465 (for the kharif) and Rs. 926 (for the rabi) were given. This was unfortunate, but it appears, as already explained under paragraph 16 of the general review, that the greater part, if not the whole, of the kharif remissions were granted for lands which were left uncultivated, and which, according to fallow rules, ought to have been cultivated.

63. The expenditure on maintenance and repairs, including establishment and tools and plant, was Rs. 1,80,066; cost of revenue collection Rs. 57,775; total charges against revenue Rs. 2,37,841. The percentage of expenditure on revenue was 38·34 and the cost of maintenance per acre ·68. The discharges for a few of the canals are given in Table VIII. Of the four canals in this district, for which capital and revenue accounts are kept, *viz.* the Mehrabwah, Alibahr Kacheri, Great Marak, and the Sarfraz, the first produced a net revenue, after deducting working expenses, of Rs. 3,156, the second a deficit of Rs. 451, and the third and fourth a net revenue each of Rs. 45,585 and Rs. 5,032 respectively. The amount of loss to the whole of the canals in this district on account of difference between assessments in force for jaghir and Government lands was Rs. 83,455.

FULELI CANALS.

64. Notwithstanding the favourable nature of the inundation the results on the canals in the Fuleli Districts, unlike those in other districts, were not favourable as will be seen from the figures in the following table :—

	Years.	Cultivation.			Net Assessed Revenue.			Rate per Acre.		
		Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Mean.
		Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Fuleli.	1881-82	166,037	7,209	173,246	3,71,935	10,751	3,82,686	2·24	1·49	2·21
	1882-83	144,418	10,863	155,281	3,36,099	10,866	3,46,965	2·33	1·00	2·23
	1883-84	156,645	5,668	162,313	3,33,536	10,997	3,94,533	2·45	1·94	2·43
	1884-85	158,706	11,771	170,477	3,58,135	20,579	3,78,714	2·25	1·74	2·22
Other Canals.	1881-82	14,619	424	15,043	35,865	918	36,783	2·45	2·16	2·44
	1882-83	15,754	1,067	16,821	34,276	1,061	35,337	2·17	1·00	2·10
	1883-84	16,341	323	16,664	47,962	1,937	49,899	2·93	5·99	2·99
	1884-85	11,824	871	12,695	33,606	1,900	35,506	2·84	2·18	2·80

65. The result for the year on the Fuleli is an increase of 8,164 acres of cultivation and a decrease of Rs. 15,819 of net assessed revenue. The result on other canals by similar comparison is a decrease in the area of cultivation and net assessed revenue of respectively 3,969 acres and Rs. 14,393. Taking the canals in the district as a whole the result is a net increase of 4,195 acres of cultivation and a decrease of Rs. 30,212 of net assessed revenue, the irrigation share of which is Rs. 27,190. This result, as has been noticed in paragraph 5 under general review, is an arbitrary one indeed, as it is not apparent why an increased area of cultivation of 4,195 acres should result in a decreased revenue. There is probably some reason for this, but the Irrigation Department, as remarked in the paragraph referred to, has not been made aware of it. On the Fuleli remissions to the extent of Rs. 3,231 were given; the greater part of this sum was due to damages to crop by breaches: on other canals a small sum, *viz.* Rs. 15, was given in remissions. Some of the canals in the Fuleli Districts, as for instance the Aliwah, Sherwah, and Sanhi Guni, being the three branches into which the Guni finally breaks up, are said to be in a bad state, and the result of this is traced to the circumstance that there is not employment for nearly all the agricultural population, cultivation is cramped and crops are liable to destruction in different places from drought or floods; parts of the districts are submerged; others are without water for ordinary irrigation, and the loss of revenue due to this state of things is put down at between 1 and 1½ lákhs per annum. Extra funds may be necessary to put the canals referred to in order.

66. Taking all the canals in the districts together, the expenditure on maintenance and repairs, including establishment and tools and plant, was

Rs. 2,04,477; cost of revenue collection Rs. 28,277; total charges against revenue being Rs. 2,32,754. The percentage of expenditure on revenue was 58·93 and the cost of maintenance per acre 1·03. The amount of loss to canals on account of difference between assessments in force for jaghir and Government lands was Rs. 74,393. The net revenue of the Fuleli, after deducting working expenses, was Rs. 37,314. The average discharge of the Fuleli and some other canals are given in Table VIII. The average before improvement for the Fuleli has been reduced for the first time from Rs. 1,67,604 to Rs. 1,30,284.

KARA'CHI COLLECTORATE.

KARA'CHI CANALS.

67. The outturn of the year's irrigation operation compares very favourably with that of the previous year, showing a marked increase of cultivation and revenue and a considerable decrease in remissions. In the Sehwan District, comprising the tálukas of Dadu, Sehwan, Mánjhand, and Kotri, the kharif and rabi crops were both above the average; in the Dadu Táluka this result was chiefly due to the good and steady supply in the Nára. In the Tatta, Mirpur, Sakro, and Ghorabari Tálukas, which form the Jerruck District, the cultivation was about the average. In the Sháhbandar District, comprising the Sujáwal, Mirpur Batoro, Jati, and Sháhbandar Tálukas, there was a slight increase in kharif cultivation, principally in the Sujáwal Táluka, accompanied by a decrease of about Rs. 5,000 of kharif revenue due to a falling off in the Mirpur Batoro táluka. This decrease of revenue can only be accounted for by the usual restriction of cultivation that invariably takes place in the second year of a new settlement. In this district there was a considerable increase of rabi cultivation on account of floods from some breaches in the river bunds. The results of the year's operations for the whole of the canals in the Karáchi Canals District are given in the following table:—

Years.	Cultivation.			Consolidated Assessment.			Remissions.			Net Assessed Revenue.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	175,384	35,851	211,235	4,67,053	1,06,162	5,73,215	58,640	2,981	61,621	5,11,594
1884-85	186,657	45,319	231,976	4,77,245	1,28,542	6,05,787	11,763	5,051	16,814	5,88,973
Difference ..	+11,273	+9,468	+20,741	+10,192	+22,380	+32,572	−46,877	+2,070	−44,807	+77,379

68. There was an increase in the area of cultivation and in net assessed revenue of 20,741 acres and Rs. 77,379 respectively. These favourable results are due entirely to the increased expenditure on ordinary clearance and repairs to river embankments and the better character of the inundation. The greater part of the remissions were due to crop sown on high land, to floods from the river in the Sháhbandar Districts and Ghorábari Táluka, to afflux of salt water at the tail of some canals, and to deficient supply on high lands. The remissions shown in the above table are also for damages done by rats and other outside causes.

69. The Nára, which is the principal irrigating channel of the Sehwan and Dadu Tálukas of the Sehwan District, worked exceedingly well; throughout the kharíf season the supply was seasonable and ample, and there was also a good supply for wheat in the rabi season. The supply in this canal has been so good for last two seasons that the landowners on the west are endeavouring to get a share, instead of their present precarious supply from rain in the hills. It is doubtful however whether cultivation from the Nára can be much extended in this direction, for the slope of the country is unfavourable and little water can be spared without increasing the carrying capacity of the canal. As a slight help to this end the old embankments are gradually strengthened, and when complete some surplus water may possibly be available for distribution on the west bank. The other canals in this district are small inundation canals; they carried a good supply and worked very well. The only canals in the Jerruck District requiring remark are the Kalri and Baghar. The supply in the former was excellent throughout the season and worked well in every respect, supplying all cultivation fully and in due time. In the Baghar also there was a marked

improvement evident, the supply being very fair, and only failing in some few numbers of very high lying land. The new mouth worked very satisfactorily, and there is every hope of its restoring the land on this canal to its former prosperous condition, as it is enlarged and regulated. The other canals are unimportant but worked satisfactorily, affording ample water for all purposes.

70. Some dehs along the Uchita mouth of the Indus suffered from afflux of sea water which was greater than usual as the new mouth of this branch had not enlarged itself sufficiently to carry a supply of fresh water able to keep back the salt: but this is not likely to happen again as the mouth is now fairly wide. The supply in this branch of the Indus was very bad the previous season, and fearing a repetition of this a considerable area of land was left uncultivated till too late and there was some failure of crops in consequence.

71. The usual floods swept over the Ghorabari Táluka, it is hoped for the last time, as the Bukerani bund, since taken in hand, is now completed.

72. In the Sháhbandar District the principal canal is the Pinyari which waters by far the greater part of the four tálukas. The supply in this important feeder was as good as it is ever likely to be: it was amply sufficient and seasonable, and for the first time for years there were no breaches. This satisfactory result is owing to the favorable nature of the inundation, the thorough clearance carried out in most of the branches and the power of regulating the supply afforded for the first time by the sluices constructed below Darah. The supply and working of the other canals in this district were very fair and the harvest was the best for many years. This district is protected from river floods by a continuous line of embankment 65 miles long which is in tolerably fair repair and will yearly gain strength from consolidation. There were several leaks on this line, only one turning into a breach, but it occurred late in the season and the damage was trifling.

73. The expenditure on maintenance and repairs of the canals and bunds in the whole district was Rs. 1,57,253; establishment and tools and plant Rs. 45,501; cost of revenue collection Rs. 53,956; total charges against revenue Rs. 2,56,701. The percentage of expenditure on revenue was 47·02 and the cost of maintenance per acre 1·02. The amount of loss to the canals on account of difference between assessments in force for jághir and Government lands was Rs. 37,928.

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

Superintending Engineer's Office,
Camp Sehwan, 15th December 1885.

No. 4918 of 1885.

PUBLIC WORKS DEPARTMENT.

(Irrigation).

Commissioner's Office, Camp Akatar,

22nd December 1885.

Forwarded to Government.

2. The inundation of 1884 was, as explained by the Acting Superintending Engineer for Irrigation, a remarkably good one, and the season consequently was an excellent one for cultivation. The rainfall was also favourable. As was to be expected, the favourable inundation led to an increase in cultivation, the increase over the area cultivated in 1883-84 being acres 156,447 of kharíf and acres 67,715 of rabi, yielding an increased irrigation revenue of Rs. 4,48,012, a result which, though due to a favourable inundation, could not have been counted on, had not the improved clearances of late years rendered increased cultivation possible and the protective embankments given the zamindárs confidence sufficient to induce them to bring fresh lands under the plough. Some of the increase in revenue is also, as Mr. Whiting points out, due to increased rates, but as increased rates would rather have a tendency to check than increase cultivation, the increase is all the more satisfactory.

3. Mr. Whiting in his fifth paragraph expresses surprise at there being an increase in cultivation and yet a decrease in revenue in the Fuleli Canals District. "If" (he remarks) "there is any cause for such a remarkable result the Irrigation Department is not aware of it." Who is referred to as "the Irrigation Department" the Commissioner is not aware, but the Executive Engineer of the Fuleli District should have had no difficulty in explaining to Mr. Whiting the causes that might, and it must be presumed have produced the results that so surprise him. The southern tálukas of the Hyderabad Collectorate which form the Fuleli Canals District have not all been settled, some being under the old "diffused rates," while in others, as for instance Badin and Tando Bago, old leases are still in force. In this part, as Colonel LeMesurier has often pointed out, increased cultivation does not mean increased revenue, as however great the area within leased lands that is cultivated the revenue collections do not vary. The only increase possible being in the case of "bigoti" lands, that is lands taken up on an assessment per acre. Thus a decrease in the cultivation in the settled Guni Táluka (and there has been a decrease in the area in that táluka under kharif crops) and an increase in the unsettled tálukas would produce the results referred to by Mr. Whiting. The tálukas forming the southern portion of the Hyderabad District are now being surveyed and settlement rates will very shortly be introduced when the present state of things will cease and probably an increased revenue be obtained.

4. The list given by Mr. Whiting in his 7th paragraph of tálukas into which a settlement has not yet been introduced is inaccurate. He has mixed up tálukas which have never been settled with tálukas into which a *revised* settlement has not yet been introduced, and in his 8th paragraph he seems to have confounded settlement operations with surveys.

5. The table given in paragraph 9 shows the net canal revenue for each canal division for 1884-85 and the five preceding years, and as pointed out by Mr. Whiting the results are most satisfactory.

6. In his 11th and 12th paragraphs the Acting Superintending Engineer refers to the hakaba outstanding. There is, as he shows, a very large sum due from Khelat cultivators, although the Political Agent, Colonel Reynolds, has more than once had his attention called to the subject. It is clear that more pressure should be brought to bear on the cultivators beyond the frontier. Why this is not done there is no way of knowing, as the matter is in no way within the control of the Sind authorities. There is no reason, so far as the Commissioner is aware, why the cultivators beyond the frontier should pay less regularly than those in the Frontier District as the cultivating classes are the same. With regard to the hakaba due within Sind the Acting Superintend-

ing Engineer has apparently overlooked the fact that the greater part of the so-called outstanding balance was not due till after the close of the financial year. The figures given by him show collections down to the end of March only, while the revenue instalments are due after that date. The last kharif instalment falls due on April 1st and the rabi instalments on 15th May, 15th June, and 15th July. From the figures obtained for the Commissioner's Revenue Report for 1884-85 he finds that the balance of hakaba due from Sind districts at the close of the year was as follows:—

	Rs.	a.	p.
Upper Sind Frontier	77	2	0
Shikárpur	1,751	4	0
Hyderabad	4,030	10	0
Karáchi	356	3	0
Thar and Párkar	.....		
Total Rs.	6,215	3	0

6. As the last instalment fell due only 15 days before the year this result is satisfactory.

7. The figures given by Mr. Whiting at the close of his 12th paragraph regarding the Hyderabad District certainly seem to point to a mistake somewhere, and the Collector will be asked to offer an explanation.

8. The remissions for the year are considerable (Rs. 1,12,048), but it will be seen that of this amount Rs. 87,976 are due on lands on the Ghár Canal and in Hyderabad. The remissions on the former were chiefly due to breaches and floods, to a great extent the result of heavy rain in the mountains, and all were absolutely necessary. As usual they were granted after consulting the Executive Engineer in charge of the canal. Those in Hyderabad or at least the greater part of them might be termed nominal remissions, being assessment due on lands left for years uncultivated by the holders who had more land than they could manage, and the holders were called on to pay the assessment in order that the lands might in a formal way be forfeited and again brought on the list of unoccupied lands.

9. It is not necessary to follow the Acting Superintending Engineer through his details regarding different canals. Last year it was the Commissioner's pleasant duty to call attention to the good results to the province from the improvements carried out during recent years by the Irrigation Department and this year's report well supplements these remarks. The year has been an unusually good one and much good work has been done, but a great deal still remains to be effected before even existing works and systems of canals can be considered fairly secure.

H. N. B. ERSKINE,
Commissioner in Sind.

TABLE I.

Cultivation and Water-share of Net Consolidated Revenue for 1884-85 and three previous years.

Canals and Districts.	1881-82.		1882-83.		1883-84.		Average.		1884-85.	
	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
Begári Canals — Desert Canal	62,645	1,04,174	71,869	1,18,901	55,490	96,341	63,335	1,06,472	74,409	1,29,157
Begári Canal	75,823	1,32,180	103,532	1,87,985	105,302	1,95,030	94,886	1,71,732	132,215	2,40,514
Káshmor Bund	....	....	645	1,144	2,122	3,804	922	1,649	3,984	7,158
Shikárpur Canals — Canals in Rohri	46,232	1,06,134	51,348	1,08,472	43,691	1,02,392	47,091	1,05,666	68,235	1,38,844
Bunds in Rohri	3,540	7,280	3,821	7,224	2,305	5,209	3,222	6,571	3,977	7,490
Sind Canal	47,919	1,24,521	49,957	1,15,206	41,184	1,01,464	46,353	1,13,750	46,221	1,18,644
Sukkur-Begári Bund	....	....	....	....	....	....	....	....	....	....
Ghár Canals — Sukkur Canal	66,304	1,08,588	73,283	1,53,981	59,630	1,38,145	66,406	1,33,570	71,057	1,63,182
Ghár ,,	208,266	5,65,260	230,265	6,52,215	194,735	6,39,430	211,105	6,18,968	212,574	6,71,131
Nára ,,	126,643	3,85,043	122,809	3,38,273	98,518	3,06,992	115,990	3,43,436	131,892	3,96,248
Wahur ,,	7,823	20,535	9,677	22,337	7,100	15,423	8,200	19,432	8,766	20,946
Marvi ,,	3,887	12,031	3,698	10,237	3,446	9,051	3,677	10,440	3,744	10,005
Bunds, right bank	93	180	12	41	23	95	43	105	89	156
Eastern Nára Canals — Nára Supply Channel	278	768	62	138	398	1,027	246	644	742	2,005
Eastern Nára	9,873	18,282	7,866	10,030	9,655	16,205	9,131	15,022	10,098	20,555
Mithrao Canal	67,559	1,19,260	56,993	92,426	64,989	1,14,513	63,173	1,08,733	73,092	1,32,484
Thar Canal	9,299	15,435	9,150	16,110	16,059	20,691	11,503	20,412	23,176	44,451
Dimwah	821	1,513	1,130	2,151	1,276	1,901	1,076	1,855	1,796	2,944
Heranwah	41	78	136	249	225	323	134	217	586	818
Hyderabad Canals — Mehrabwah	8,095	15,393	11,644	18,765	9,631	19,052	9,790	17,737	10,092	19,684
Nasrat	12,776	37,766	22,651	44,929	11,046	29,003	15,491	37,233	16,276	39,933
Nayiakhi	34,305	84,887	40,171	94,377	38,452	88,028	37,643	89,097	45,604	1,03,393
Dámbro	5,852	13,216	5,627	13,079	5,303	12,392	5,594	13,096	5,166	11,652
Dád	18,522	42,575	19,245	40,768	17,147	37,023	18,305	40,122	17,283	36,694
Rein	10,213	21,156	10,339	21,603	9,871	21,941	10,141	21,567	13,516	26,774
Alibahr Kacheri	8,112	17,292	7,835	15,264	7,085	14,164	7,677	15,578	8,090	16,831
Márak	43,010	1,01,152	41,084	91,514	39,154	86,269	41,083	92,978	41,226	88,480
Gharo Mahmuda	42,778	87,189	41,681	79,947	42,302	77,704	42,254	81,613	52,408	98,437
Kari Shumali	27,683	42,892	27,942	38,687	28,298	37,981	27,974	39,853	28,306	40,100
Nasir	25,972	41,009	25,021	40,347	23,041	40,604	24,678	40,653	25,269	48,419
Sarfráz	20,661	26,006	17,704	24,324	16,698	25,095	18,354	25,309	19,516	28,187
Other Canals	19,108	43,869	21,206	48,832	17,089	41,642	19,334	44,781	20,936	45,772
Fuleli Canals — Fuleli	173,246	3,44,417	155,281	3,12,269	162,313	3,55,080	163,613	3,37,255	170,477	3,40,844
Other Canals	15,043	33,105	16,821	31,803	16,664	44,909	16,176	36,606	12,695	31,955
Karáchi Canals — Nára	56,487	1,02,229	72,353	1,48,245	64,190	1,45,333	64,343	1,61,936	73,187	1,64,445
Phitta	5,534	26,773	5,912	13,730	4,746	9,048	5,397	16,517	5,424	10,662
Canals north of Kotri	10,121	26,456	13,877	28,903	10,550	20,521	11,516	25,293	12,597	24,464
Kalri	8,331	21,499	9,728	19,054	5,827	13,790	7,962	18,114	6,036	15,713
Baghár	12,601	28,072	15,971	30,516	11,908	21,109	13,493	28,566	12,821	25,268
Uchita	13,812	31,804	12,315	29,643	9,573	21,372	11,900	27,606	8,804	18,825
Canals in Tatta, &c.	7,425	15,998	8,234	12,515	5,724	11,406	7,128	13,306	7,471	15,800
Shal Canals	....	....	....	....	1,023	1,639	341	546	2,115	5,542
Pinyári	52,525	1,07,276	54,268	77,812	51,331	1,21,790	52,708	1,02,293	56,093	1,41,952
Canals in Mirpur Batoro	9,736	20,454	9,694	15,651	9,485	23,007	9,639	19,704	9,193	23,849
Canals in Sujával	5,796	12,029	10,738	8,808	6,648	15,503	7,727	12,118	7,135	17,006
Satta	7,432	18,136	8,425	16,621	6,688	17,265	7,498	17,341	7,171	17,663
Canals in Jati	1,591	4,095	1,725	3,222	1,202	4,046	1,506	3,788	1,774	4,396
Khanta	6,162	11,788	6,393	9,761	5,957	8,621	6,171	10,057	5,207	9,692
Kokawari	15,999	32,814	15,138	26,120	14,145	21,152	15,094	26,695	15,012	31,587
Canals in Shahbandar	2,203	4,628	2,471	4,482	1,870	3,481	2,182	4,197	2,363	4,622
Bunds, left bank	750	1,765	458	1,445	418	1,352	542	1,521	413	1,287
Bunds, right bank	....	....	87	132	....	....	29	44	....	....
Begari Canals	138,468	2,36,354	176,046	3,08,030	162,914	2,95,175	159,143	2,79,853	210,608	3,76,829
Shikárpur Canals	97,691	2,37,935	105,126	2,30,902	87,180	2,09,065	96,666	2,25,987	118,433	2,64,978
Ghár Canals	413,016	10,91,632	439,744	11,77,084	363,502	11,09,136	405,421	11,25,951	423,122	12,61,668
Eastern Nára Canals	87,871	1,55,286	75,337	1,21,704	92,582	1,63,660	85,263	1,46,883	109,490	2,03,157
Hyderabad Canals	277,087	5,74,402	292,150	5,73,536	265,717	5,30,898	278,318	5,59,612	303,638	6,04,356
Fuleli Canals	188,289	3,77,522	172,102	3,44,072	178,977	3,99,989	179,789	3,73,861	183,172	3,72,799
Karáchi Canals	216,507	5,55,816	247,787	4,46,660	211,235	4,69,435	225,176	4,87,037	232,816	5,32,593
Total	1,418,929	32,28,947	1,508,292	32,02,048	1,362,107	31,68,358	14,29,776	31,99,784	1,586,279	36,16,370

TABLE II.

Area of Cultivation and Canal Revenue for 1884-85 and five previous years.

Years.	Cultivation.			Water share of net consolidated revenue.	Hakaba.	Miscellaneous.	Total Canal Revenue.
	Government.	Jághir.	Total.				
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1879-80	1,342,753	111,275	1,454,028	27,72,085	41,575	39,547	28,53,207
1880-81	1,328,662	164,007	1,492,669	28,43,067	41,722	59,243	29,44,032
1881-82	1,418,929	183,057	1,601,986	32,28,947	74,828	41,966	33,45,741
1882-83	1,508,292	165,001	1,673,293	32,02,048	87,057	49,739	33,38,844
1883-84	1,362,107	178,724	1,540,831	31,68,358	85,134	53,560	33,07,052
Average	1,392,148	160,413	1,552,561	30,42,901	66,063	48,811	31,57,775
1884-85	1,586,279	196,894	1,783,173	36,16,370	1,06,090	50,706	37,73,166
Increase or Decrease	+1,94,131	+36,481	+230,612	+5,73,469	+40,027	+1,895	+6,15,391

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE III.

Area of Cultivation and Canal Revenue for 1884-85.

Canals, Executive Districts, and Collectorates.			Cultivation. Government.	Cultivation. Jághir.	Cultivation. Total.	Water share of net consolidated revenue as in Table VII.	Hakaba.	Miscellaneous.	Total Canal Revenue.
			Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Frontier Upper Sind.	Begári Canals.	Desert Canal	74,409	33,077	107,486	1,29,157	28,463	187	1,57,807
		Begári Canal	132,215	41,611	173,826	2,40,514	33,982	579	2,75,075
		Works for which no Capital or Revenue accounts are kept	3,984	...	3,984	7,158	...	158	7,316
Shikárpur ...	Shikárpur Canals.	Canals in Rohri	68,235	1,009	69,244	1,38,844	413	1,357	1,40,614
		Bunds in Rohri	3,977	...	3,977	7,490	...	9	7,499
		Sind Canal	46,221	1,716	47,937	1,18,644	469	309	1,19,422
		Sukkur-Begári Bund	...	...	...	...	...	2,534	2,534
		Works for which no Capital or Revenue accounts are kept	...	...	...	...	...	11	11
	Ghár Canals ...	Sukkur Canal	71,057	593	71,650	1,63,182	136	457	1,63,775
		Ghár do.	2,12,574	5,961	218,535	6,71,131	1,930	4,814	6,77,875
		Nára do.	1,31,892	9,530	141,422	3,96,248	4,277	5,219	4,05,744
		Wahúr do.	8,766	...	8,766	20,946	...	1,117	22,063
		Marvi do.	3,744	...	3,744	10,005	...	...	10,005
		Bunds, Right Bank	89	...	89	156	...	4	160
		Works for which no Capital or Revenue accounts are kept	...	...	...	...	...	7	7
Thar and Párkar.	Eastern Nára Canals.	Nára supply channel	742	659	1,401	2,005	247	3,120	5,372
		Eastern Nára	10,098	...	10,098	20,555	...	12,842	33,397
		Mithrao Canal	73,092	..	73,092	1,32,484	...	1,207	1,33,691
		Thar Canal	23,176	925	24,101	44,451	452	166	45,069
		Dimwah	1,796	...	1,796	2,844	...	4	2,848
		Heranwah	586	...	586	818	...	...	818
		Works for which no Capital or Revenue accounts are kept	...	...	...	...	...	8	8
Hyderabad ...	Hyderabad Canals.	Mehrabwah	10,092	*144	10,236	19,684	...	5	19,689
		Nasrat	16,276	361	16,637	39,933	456	325	40,714
		Naolakhi	45,604	2,599	48,203	1,03,393	730	209	1,04,332
		Dámbro	5,166	318	5,484	11,652	127	1	11,780
		Dad	17,233	4,018	21,251	36,694	1,669	189	38,552
		Rein	13,516	25	13,541	26,774	—10	93	26,857
		Alibhar Kacheri	8,090	779	8,869	16,831	276	13	17,120
		Marák	41,226	5,846	47,072	88,480	2,409	152	91,041
		Gharo Mahmuda	52,408	12,550	64,958	98,437	3,554	398	1,02,389
		Kari Shumali	28,306	7,562	35,868	40,100	2,621	287	43,008
		Nasir	25,269	1,267	26,536	48,419	263	170	48,852
		Sarfraz	19,516	4,657	24,173	28,187	790	192	29,169
		Other Canals	20,936	1,606	22,542	45,772	942	52	46,766
		Works for which no Capital or Revenue accounts are kept	...	...	...	...	...	...	...
	Fuleli Canals ...	Fuleli	170,477	41,436	211,913	3,40,844	17,502	4,349	3,62,695
		Other Canals	12,695	641	13,336	31,955	68	197	32,220
		Works for which no Capital or Revenue accounts are kept	...	...	...	...	...	...	...
Karáchi ...	Karáchi Canals.	Nára	73,187	9,438	82,625	1,64,445	1,135	4,212	1,69,792
		Phitta	5,424	1,020	6,444	10,562	243	196	11,001
		Canals north of Kotri	12,597	2,447	15,044	24,464	569	469	25,502
		Kalri	6,036	300	6,336	15,713	195	153	16,061
		Baghar	12,821	1,005	13,826	25,268	474	147	25,889
		Uchita	8,804	...	8,804	18,825	...	229	19,054
		Canals in Tatta, &c.	7,471	787	8,258	15,800	478	630	16,908
		Shal Canal	2,115	...	2,115	5,542	...	...	5,542
		Pinyári	56,093	1,518	57,611	1,41,952	616	2,257	1,44,825
		Canals in Mirpur Batoro	9,193	...	9,193	23,849	...	2	23,851
		Canals in Sujával	7,135	107	7,242	17,006	13	4	17,023
		Satta	7,171	307	7,478	17,663	85	20	17,768
		Other Canals in Jati	1,774	41	1,815	4,396	48	...	4,444
		Khanta	5,207	323	5,530	9,602	67	...	9,669
		Kokawari	15,012	...	15,012	31,587	...	519	32,106
		Canals in Shahbandar	2,363	212	2,575	4,622	87	228	4,937
		Bunds, left bank	413	365	778	1,287	108	...	1,395
		Bunds, right bank	...	134	134	...	206	...	206
		Works for which no Capital or Revenue accounts are kept	...	...	...	...	...	899	899
Begári Canals			210,608	74,688	285,296	3,76,829	62,445	924	4,40,198
Shikárpur Canals			118,433	2,725	121,158	2,64,978	882	4,220	2,70,080
Ghár Canals			428,122	16,084	444,206	12,61,668	6,343	11,618	12,79,629
Eastern Nára Canals			109,490	1,584	111,074	2,03,157	699	17,347	2,21,203
Hyderabad Canals			303,638	41,732	345,370	6,04,356	13,827	2,086	6,20,269
Fuleli Canals			183,172	42,077	225,249	3,72,799	17,570	4,546	3,94,915
Karáchi Canals			232,816	18,004	250,820	5,32,583	4,324	9,965	5,46,872
		Total ...	1,586,279	1,96,894	1,783,173	36,16,370	1,06,090	50,706	37,73,166

*Free grant.

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE IV.

Revenue Expenditure on new Works, Maintenance and Repairs and Revenue Collection Charges in the Civil Department for 1884-85.

Canals and Executive Districts.	Revenue Expenditure.								Total Revenue Expenditure.			
	Improvements.			Maintenance and Repairs.			Revenue collection charges in Civil Department.	Total.	Works.	Establishment.		Total.
	Works.	Establishment and Tools and Plant.	Total.	Works.	Establishment and Tools and Plant.	Total.				Public Works Department.	Civil Department.	
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals.												
Desert Canal	...	...	...	23,158	8,328	31,486	12,063	43,549	23,158	8,328	12,063	43,549
Begári Canal	...	...	...	44,681	13,669	58,350	22,835	81,185	44,681	13,669	22,835	81,185
Kashmor Bund	...	...	...	38,786	5,748	44,534	716	45,250	38,786	5,748	716	45,250
Shikárpur Canals.												
Canals in Rohri... ...	25,134	2,945	28,079	30,163	3,534	33,697	14,099	47,796	55,297	6,479	14,099	75,875
Bunds in Rohri... ...	...	...	...	4,626	542	5,168	749	5,917	4,626	542	749	5,917
Sind Canal	12,867	1,507	14,374	11,907	1,395	13,302	12,111	25,413	24,774	2,902	12,111	39,787
Sukkur-Begári Bund ...	8,852	1,037	9,889	32,022	3,751	35,773	...	35,773	40,874	4,788	...	45,662
Ghár Canals.												
Sukkur Canal	...	...	...	18,677	3,816	22,493	9,789	32,282	18,677	3,816	9,789	32,282
Ghár	31,993	6,233	38,226	75,025	14,616	89,641	57,717	1,47,358	1,07,018	20,849	57,717	1,85,584
Nára	2,168	468	2,636	48,482	10,477	58,959	41,967	1,00,926	50,650	10,945	41,967	1,03,562
Wáhur	...	...	...	1,795	388	2,183	2,510	4,693	1,795	388	2,510	4,693
Márvi	...	...	...	1,852	400	2,252	696	2,948	1,852	400	696	2,948
Bunds, right bank ...	13,037	2,817	15,854	14,358	3,102	17,460	16	17,476	27,395	5,919	16	33,330
Eastern Nára Canals.												
Nára Supply Channel ...	...	...	...	394	46	440	225	665	394	46	225	665
Eastern Nára	...	...	...	9,181	2,602	11,783	2,967	14,750	9,181	2,602	2,967	14,750
Mithrao Canal	...	...	...	20,324	11,411	31,735	13,289	45,024	20,324	11,411	13,289	45,024
Thár Canal	...	...	...	12,915	6,217	19,132	4,490	23,622	12,915	6,217	4,490	23,622
Dimwah	...	...	...	1,299	362	1,661	284	1,945	1,299	362	284	1,945
Heranwah	...	...	...	100	28	128	82	210	100	28	82	210
Hyderabad Canals.												
Mehrabwah	...	...	...	12,384	2,740	15,124	2,073	17,197	12,384	2,740	2,073	17,197
Nasrat	...	...	...	6,083	1,518	7,601	4,086	11,687	6,083	1,518	4,086	11,687
Naolákhi...	...	...	...	16,181	4,039	20,220	10,529	30,749	16,181	4,039	10,529	30,749
Dámbro	...	...	...	4,692	1,171	5,863	1,181	7,044	4,692	1,171	1,181	7,044
Dád	...	...	...	13,119	3,275	16,394	3,801	20,195	13,119	3,275	3,801	20,195
Rein	...	...	...	14,580	3,639	18,219	2,794	21,013	14,580	3,639	2,794	21,013
Alibahr Kacheri ...	...	...	...	6,377	1,411	7,788	836	8,624	6,377	1,411	836	8,624
Márak	640	138	778	9,853	2,119	11,972	6,500	18,472	10,493	2,257	6,500	19,250
Gháro Mahmuda ...	...	...	...	18,793	4,691	23,484	10,279	33,763	18,793	4,691	10,279	33,763
Kari Shumáli	...	...	...	11,281	2,816	14,097	4,574	18,671	11,281	2,816	4,574	18,671
Nasir	10,590	2,644	13,234	12,461	3,111	15,572	4,666	20,238	23,051	5,755	4,666	33,472
Sarfraz	...	...	...	8,478	1,876	10,354	1,717	12,071	8,478	1,876	1,717	12,071
Other Canals	...	...	...	10,706	2,672	13,378	4,739	18,117	10,706	2,672	4,739	18,117
Fuleli Canals.												
Fuleli	...	...	...	1,44,386	38,109	1,82,495	24,525	2,07,020	1,44,386	38,109	24,525	2,07,020
Other Canals	...	...	...	17,385	4,597	21,982	3,752	25,734	17,385	4,597	3,752	25,734
Karáchi Canals.												
Nára	6,645	1,923	8,568	11,142	3,224	14,366	16,965	31,331	17,787	5,147	16,965	39,899
Phitta	...	...	...	2,460	712	3,172	1,087	4,259	2,460	712	1,087	4,259
Canals north of Kotri ...	...	...	...	12,565	3,636	16,201	2,606	18,807	12,565	3,636	2,606	18,807
Kalri	...	...	...	9,049	2,618	11,667	1,650	13,317	9,049	2,618	1,650	13,317
Baghar	...	...	...	12,545	3,630	16,175	2,585	18,760	12,545	3,630	2,585	18,760
Uchita	...	..	...	327	95	422	1,933	2,355	327	95	1,933	2,355
Canals in Tatta, &c. ...	...	...	...	5,709	1,652	7,361	1,649	9,010	5,709	1,652	1,649	9,010
Shal Canal	2,238	648	2,886	5,544	1,604	7,148	555	7,703	7,782	2,252	555	10,589
Pinyári	6,941	2,008	8,949	37,976	10,989	48,965	14,280	63,245	44,917	12,997	14,280	72,194
Canals in Mirpur Batoro.	...	...	...	10,193	2,949	13,142	2,193	15,335	10,193	2,949	2,193	15,335
Canals in Sujáwal ...	...	...	...	1,800	521	2,321	1,736	4,057	1,800	521	1,736	4,057
Satta	...	...	...	6,291	1,820	8,111	1,807	9,918	6,291	1,820	1,807	9,918
Canals in Jati	...	...	...	170	49	219	442	661	170	49	442	661
Khánta	...	...	...	10,052	2,908	12,960	901	13,861	10,052	2,908	901	13,861
Kokawari	...	...	...	2,758	798	3,556	2,901	6,457	2,758	798	2,901	6,457
Canals in Shábbandar ..	...	...	...	5,247	1,518	6,765	506	7,271	5,247	1,518	506	7,271
Bunds, left bank ...	...	...	..	12,771	3,695	16,466	139	16,605	12,771	3,695	139	16,605
Bunds, right bank ...	25,030	7,244	32,273	10,654	3,083	13,737	21	13,758	35,684	10,327	21	46,032
Sluices in Forest Canals Shábbandar District..	5,712	1,428	7,140	...	...	...	...	...	5,712	1,428	...	7,140
Begári Canals	...	...	..	1,06,625	27,745	1,34,370	35,614	1,69,984	1,06,625	27,745	35,614	1,69,984
Shikárpur	46,853	5,489	52,342	78,718	9,222	87,940	26,959	1,14,899	1,25,571	14,711	26,959	1,67,241
Ghár Canals	47,198	9,518	56,716	1,60,189	32,799	1,92,988	1,12,695	3,05,683	2,07,387	42,317	1,12,695	3,62,399
Eastern Nára Canals ...	...	...	..	44,213	20,666	64,879	21,337	86,216	44,213	20,666	21,337	86,216
Hyderabad Canals	11,230	2,782	14,012	1,44,988	35,078	1,80,066	57,775	2,37,841	1,56,218	37,860	57,775	2,51,853
Fuleli Canals	...	...	...	1,61,771	42,706	2,04,477	28,277	2,32,754	1,61,771	42,706	28,277	2,32,754
Karachi Canals...	46,566	13,251	59,817	1,57,253	45,501	2,02,754	53,956	2,56,710	2,03,819	58,752	53,956	3,16,527
Total ...	1,51,847	31,040	1,82,887	8,53,757	2,13,717	10,67,474	3,36,613	14,04,087	10,05,604	2,44,757	3,36,613	15,86,974

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE V.

Cultivation, Canal Revenue and Expenditure for 1884-85 as contrasted with three previous years.

	Canals and Executive Districts.	Average of 3 previous years.			Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.	1884-85.			Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.	Length in miles of	
		Cultivation.	Canal Revenue.	Maintenance and Revenue Collection.			Cultivation.	Canal Revenue.	Maintenance and Revenue Collection.			Canals	Bunds.
		Acres.	Rs.	Rs.		Rs.	Acres.	Rs.	Rs.		Rs.		
Begári Canals.	Desert Canal	90,161	1,20,124	24,641	20·51	·27	1,07,486	1,57,807	43,549	27·59	·40	115	...
	Begári Canal	1,35,992	2,00,056	73,152	36·56	·53	1,73,826	2,75,075	81,185	29·51	·46	148	...
	Kashmor Bund... ...	922	1,796	83,475	...	...	3,984	7,316	45,250	...	...	...	48
Shikárpur Canals.	Canals in Rohri ...	48,014	1,07,196	51,041	47·61	1·06	69,244	1,40,614	47,796	33·99	·69	240	...
	Bunds in Rohri ...	3,222	6,574	11,148	...	..	3,977	7,499	5,917	...	...	...	54
	Sind Canal	48,072	1,14,871	33,238	28·93	·69	47,937	1,19,422	25,413	12·90	·53	67	...
	Sukkur-Begári Bund ...	..	105	28,367	...	...	...	2,534	35,773	...	...	...	36
Ghár Canals.	Sukkur Canal	66,915	1,34,224	47,112	35·09	·70	71,650	1,63,775	32,282	19·71	·45	127	...
	Ghár	2,15,294	6,23,567	1,38,281	22·18	·64	218,535	6,77,875	1,47,358	21·73	·67	381	...
	Nára	1,23,399	3,48,792	92,957	26·65	·74	141,422	4,05,744	1,00,926	24·87	·71	231	...
	Wahur	8,200	20,377	5,508	27·03	·67	8,766	22,063	4,693	21·27	·53	23	...
	Marvi	3,677	10,440	1,893	18·13	·51	3,744	10,005	2,948	29·46	·78	15	...
	Bunds, right bank ...	43	144	24,870	...	..	89	160	17,476	...	...	...	112
Eastern Nára Canals.	Nára Supply Channel ...	371	4,207	4,106	97·59	11·06	1,401	5,372	665	12·37	·47	12	...
	Eastern Nára	9,269	31,105	17,143	55·11	1·84	10,098	33,397	14,750	44·16	1·46	20	111
	Mithrao Canal	63,174	1,09,581	34,571	31·55	·54	73,092	1,33,691	45,024	33·67	·61	141	57
	Thar Canal	12,015	20,797	14,152	68·05	1·17	24,101	45,069	23,622	52·41	·98	59	33
	Dimwah	1,076	1,855	1,437	77·47	1·33	1,796	2,848	1,945	68·29	1·08	18	...
	Heranwah	134	216	134	62·04	1·00	586	818	210	25·67	·35	3	...
Hyderabad Canals.	Mehrabwah	9,847	17,832	8,812	49·42	·89	10,236	19,689	17,197	87·34	1·68	59	...
	Nasrat	15,893	37,721	32,655	86·57	2·05	16,637	40,714	11,687	28·70	·70	66	...
	Naolákhi	39,928	90,303	39,499	43·74	·98	48,203	1,04,332	30,749	29·46	·63	137	...
	Dámbro	5,983	13,339	6,744	50·56	1·12	5,484	11,780	7,044	59·79	1·28	56	...
	Dád	22,521	42,384	14,134	33·35	·62	21,251	38,552	20,195	52·35	·95	105	...
	Rein	10,149	21,670	14,989	69·17	1·47	13,541	26,857	21,013	78·31	1·55	134	...
	Alibahr Kacheri ...	8,603	16,129	7,022	43·54	·81	8,869	17,120	8,624	50·37	·97	56	...
	Márak	46,714	95,140	17,910	18·82	·38	47,072	91,041	18,472	20·28	·39	194	1
	Gháro Mahmada ...	52,589	86,957	37,813	43·48	·71	64,958	1,02,389	33,763	32·09	·51	291	...
	Kari Shumáli	35,225	42,445	15,137	35·66	·42	35,868	43,008	18,671	43·41	·52	214	...
	Nasir	26,521	41,477	20,084	48 42	·75	26,536	48,852	20,238	41·42	·76	130	...
	Sarfráz	22,106	26,480	13,347	50·04	·60	24,173	29,169	12,071	41·38	·49	116	...
	Other Canals	20,995	45,907	15,228	33·17	·72	22,542	46,766	18,117	38·73	·80	112	...
Fuleli Canals.	Fuleli	2,00,973	3,58,762	1,53,820	42·87	·76	211,913	3,62,695	2,07,020	57·07	·97	994	...
	Other Canals	18,700	37,706	26,312	69·78	1·40	13,336	32,220	25,734	79·86	1·92	153	8
Karáchi Canals.	Nára	69,719	1,66,913	25,617	15·35	·36	82,625	1,69,792	31,331	18·45	·37	106	...
	Phitta	6,083	17,012	4,190	24·63	·68	6,444	11,001	4,259	38·71	·66	27	...
	Canals north of Kotri ...	12,855	25,770	14,149	54·9	1·10	15,044	25,502	18,807	73·74	1·25	58	...
	Kalri	8,429	18,548	19.195	103·49	2·27	6,336	16,061	13,317	82·91	2·10	136	...
	Baghar	14,768	27,211	10,983	40·36	·74	13,826	25,889	18,760	72·46	1·35	114	...
	Uchita	11,900	27,644	3,944	14·27	·33	8,804	19,054	2,355	12·35	·26	44	...
	Canals in Tatta, &c. ...	8,112	14,297	9,396	65·72	·15	8,258	16,908	9,010	53·28	1·09	96	...
	Shal Canals	341	546	871	159·52	2·55	2,115	5,542	7,703	138·99	3·64	18	...
	Pinyári	54,301	1,05,020	80,750	76·89	1·48	57,611	1,44,825	63,245	43·66	1.09	369	...
	Canals in Mirpur Batoro..	9,639	19,706	10,976	55·69	1·13	9,193	23,851	15,335	64·25	1·66	99	...
	Canals in Sujáwal ...	7,857	12,175	2,721	22·35	·34	7,242	17,023	4,057	23·83	·56	51	...
	Satta	7,771	17,476	6,560	37·54	·84	7,478	17,768	9,918	55·81	1·32	58	...
	Canals in Jati	1,668	3,834	1,463	38·16	·87	1,815	4,444	661	14·87	·36	11	...
	Khánta	6,364	10,127	8,461	83·55	1·32	5,530	9,669	13,861	143·35	2·50	59	...
	Kokawari	15,094	26,803	3,403	12·69	·22	15,012	32,106	6,457	20·11	·43	100	...
	Canals in Shahbandar ...	2,354	4,669	2,823	60·46	1·15	2,575	4,937	7,271	147·27	3·19	32	...
	Bunds, left bank ...	920	1,667	34,727	...	...	778	1,395	16,605	...	...	...	65
	Bunds, right bank ...	498	217	17,171	...	...	134	206	13,758	...	...	...	28
	Begári Canals	227,075	3,21,976	1,81,268	56·29	·79	285,296	4,40,198	1,69,984	38·61	·59	263	48
	Shikárpur Canals	99,308	2,28,746	1,23,794	54·12	1·24	121,158	2,70,069	1,14,899	42·54	·94	307	90
	Ghár Canals	417,528	11,37,544	3 10,621	27·30	·74	444,206	12,79,622	3,05,683	23·88	·68	777	112
	Eastern Nára Canals	86,039	1,67,761	71,543	42·64	·83	111,074	2,21,195	86,216	38·97	·77	253	201
	Hyderabad Canals	317,074	5,77,784	2,43,374	42·12	·76	345,370	6,20,269	2,37,841	38·34	·68	1,670	1
	Fuleli Canals	219,673	3,96,468	1,80,132	45·43	·82	225,249	3,94,915	2,32,754	58·93	1·03	1,147	8
	Karáchi Canals...	238,673	4,99,635	2,57,400	51·51	1·07	250,820	5,45,973	2,56,710	47·02	1·02	1,378	93
	Total ...	1,605,370	33,29,914	13,68,132	41·08	·85	1,783,173	37,72,241	14,04,087	·37·21	·78	5,795	553
	Add Agricultural Receipts ...							925					
	Total ..							37,73,166					

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE VI.

Direct and Indirect receipts of Canal Revenue for 1884-85.

Canals and Districts.		Water share of net consolidated revenue as in Table VII.	Deduct average before improvements.	Balance irrigation share due to Canals.	Direct receipts, Hakaba and Miscellaneous.	Difference of assessment on Jághir land.	Total direct and indirect receipts.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	Desert Canal	1,29,157	...	1,29,157	28,650	27,090	1,84,897
	Begári Canal	2,40,514	24,856	2,15,658	34,561	41,709	2,91,928
	Káshmor Bund	7,158	...	7,158	158	...	7,316
Shikárpur Canals	Canals in Rohri	1,38,844	...	1,38,844	1,770	1,725	1,42,339
	Bunds in Rohri	7,490	...	7,490	9	...	7,499
	Sind Canal	1,18,644	...	1,18,644	778	4,764	1,24,186
	Sukkur-Begári Bund	.....	...	.....	2,534	...	2,534
Ghár Canals	Sukkur Canal	1,63,182	71,550	91,632	593	1,614	93,839
	Ghár	6,71,131	1,16,832	5,54,299	6,744	15,674	5,76,717
	Nára	3,96,248	...	3,96,248	9,496	27,056	4,32,800
	Wahur	20,946	...	20,946	1,177	...	22,123
	Marvi	10,005	...	10,005	...	...	10,005
	Bunds, right bank	156	...	156	4	...	160
Eastern Nára Canals.	Nára Supply Channel	2,005	..	2,005	3,367	1,780	7,152
	Eastern Nára	20,555	3,444	17,111	12,842	...	29,953
	Mithrao Canal	1,32,484	...	1,32,484	1,207	...	1,33,691
	Thar Canal	44,451	...	44,451	618	1,515	46,584
	Dimwah	2,844	...	2,844	4	...	2,848
	Heranwah	818	...	818	...	...	818
Hyderabad Canals	Mehrabwah	19,684	...	19,684	5	240	19,929
	Nasrat	39,933	...	39,933	781	409	41,123
	Naolakhi	1,03,393	...	1,03,393	939	6,514	1,08,846
	Dambro	11,652	...	11,652	128	1,177	12,957
	Dad	36,694	...	36,694	1,858	14,202	52,754
	Rein	26,774	...	26,774	83	54	26,911
	Alibahr Kacheri	16,831	8,427	8,404	289	1,650	10,343
	Márak	88,480	36,459	52,021	2,561	12,341	66,923
	Gharo Mahmuda	98,437	...	98,437	3,952	27,980	1,30,369
	Kari Shumali	40,100	...	40,100	2,908	8,053	51,061
	Nasir	48,419	...	48,419	433	2,918	51,770
	Sarfraz	28,187	11,155	17,032	982	3,227	21,241
	Other Canals	45,772	...	45,772	994	4,690	51,456
Fuleli Canals	Fuleli	3,40,844	1,30,284	2,10,560	21,851	72,631	3,05,042
	Other Canals	31,955	..	31,955	265	1,762	33,982
Karáchi Canals	Nára	1,64,445	...	1,64,445	5,347	20,232	1,90,024
	Phitta	10,562	...	10,562	439	1,919	12,920
	Canals north of Kotri	24,464	...	24,464	1,038	3,653	29,155
	Kalri	15,713	...	15,713	348	759	16,820
	Baghar	25,268	...	25,268	621	2,111	28,000
	Uchita	18,825	...	18,825	229	...	19,054
	Canals in Tatta, &c.	15,800	...	15,800	1,108	1,783	18,691
	Shal Canals	5,542	...	5,542	...	...	5,542
	Pinyári	1,41,952	...	1,41,952	2,873	3,758	1,48,583
	Canals in Mirpur Batoro	23,849	...	23,849	2	...	23,851
	Canals in Sujával	17,006	...	17,006	17	282	17,305
	Satta	17,663	...	17,663	105	828	18,596
	Canals in Jati	4,396	...	4,396	48	73	4,517
	Khanta	9,602	..	9,602	67	902	10,571
	Kokawari	31,587	..	31,587	519	...	32,106
	Canals in Shahbandar	4,622	...	4,622	315	568	5,505
	Bunds, left bank	1,287	...	1,287	108	826	2,221
	Bunds, right bank	.....	...	.....	206	234	440
Begári Canals		3,76,829	24,856	3,51,973	63,369	68,799	4,84,141
Shikárpur Canals		2,64,978	...	2,64,978	5,091	6,489	2,76,558
Ghár Canals		12,61,668	1,88,382	10,73,286	17,954	44,344	11,35,584
Eastern Nára Canals		2,03,157	3,444	1,99,713	18,038	3,295	2,21,046
Hyderabad Canals		6,04,356	56,041	5,48,315	15,913	83,455	6,47,683
Fuleli Canals		3,72,799	1,30,284	2,42,515	22,116	74,393	3,39,024
Karáchi Canals		5,32,583	...	5,32,583	13,390	37,928	5,83,901
	Total	36,16,370	4,03,007	32,13,363	1,55,871	3,18,703	36,87,937
	Add—Agricultural receipts				*925	...	925
	Total				1,56,796	3,18,703	36,88,862

* Includes Rs. 896 on account of credit for articles issued from the Mathematical Depôt in Sind, which is treated in the Examiner's accounts as reduction of outlay.

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE VI.A.

Actual Direct and Indirect Receipts of Canal Revenue in 1884-85 as shown in the General Revenue Accounts of Executive Districts prepared by the Examiner, Public Works Accounts.

Canals and Districts.	Water share of net consolidated Revenue collected.	Deduct average before improvement.	Balance irrigation share due to Canals.	Direct Receipts —Hakaba and Miscellaneous.	Difference of Assessment on Jághir Lands.	Total Direct and Indirect Receipts.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals ... Desert Canal ...	1,20,398	.....	1,20,398	28,650	27,090	1,76,138
Begári Canal ...	2,51,551	24,856	2,26,695	34,561	41,709	3,02,965
Kashmor Bund...	7,158	.....	7,158	158	.....	7,316
Shikárpur Canals ... Canals in Rohri	1,40,410	.....	1,40,410	1,770	1,725	1,43,905
Bunds in Rohri...	7,493	.....	7,493	20	.....	7,513
Sind Canal ...	1,20,531	.....	1,20,531	778	4,764	1,26,073
Sukkur-Begári Bund ...	.....	.....	.....	2,534	.....	2,534
Ghár Canals ... Sukkur Canal ...	1,69,251	71,550	97,701	593	1,614	99,908
Ghár ...	6,89,730	1,16,832	5,72,898	6,744	15,674	5,95,316
Nára ...	4,10,953	.....	4,10,953	9,496	27,056	4,47,505
Wáhur ...	20,946	.....	20,946	1,177	.....	22,123
Márvi ...	10,005	.....	10,005	.....	.....	10,005
Bunds, right bank ...	156	.....	156	4	.....	160
Eastern Nára Canals ... Nára Supply Channel...	2,005	.....	2,005	3,367	1,780	7,152
Eastern Nára ...	20,574	3,444	17,130	12,842	.....	29,972
Mithrau Canal ...	1,32,887	.....	1,32,887	1,207	.....	1,34,094
Thar Canal ...	44,451	.....	44,451	618	1,515	46,584
Dimwah ...	2,844	.....	2,844	4	.....	2,848
Heranwah ...	818	.....	818	.....	.....	818
Hyderabad Canals ... Mehrabwah ...	20,732	.....	20,732	5	240	20,977
Nasrat ...	40,400	.....	40,400	781	409	41,590
Naolákhi ...	1,04,534	.....	1,04,534	939	6,514	1,11,987
Dambro ...	11,684	.....	11,684	128	1,177	12,989
Dad ...	36,346	.....	36,346	1,858	14,202	52,406
Rein ...	27,945	.....	27,945	83	54	28,082
Alibhar Kacheri ...	16,509	8,427	8,082	289	1,650	10,021
Márak ...	99,049	36,459	62,590	2,561	12,341	77,492
Gháro Mahmuda ...	98,839	.....	98,839	3,952	27,980	1,30,771
Kari Shumáli ...	43,521	.....	43,521	2,908	8,053	54,482
Nasir ...	46,400	.....	46,400	433	2,918	49,751
Sarfraz ...	27,539	11,155	16,384	982	3,227	20,593
Other Canals ...	46,444	.....	46,444	994	4,690	52,128
Fuleli Canals... Fuleli ...	3,58,036	1,30,284	2,27,752	21,851	72,631	3,22,234
Other Canals ...	37,454	.....	37,454	265	1,762	39,481
Karáchi Canals ... Nára ...	1,64.312	.....	1,64,312	5,347	20,232	1,89,891
Phitta ...	10,430	.....	10,430	439	1,919	12,788
Canals north of Kotri...	25,019	.....	25,019	1,038	3,653	29,710
Kalri ...	16,179	.....	16,179	348	759	17,286
Baghar ...	25,231	.....	25,231	621	2,111	27,963
Uchita ...	19,097	.....	19,097	229	.....	19,326
Canals in Tatta, &c. ...	15,386	.....	15,386	1,108	1,783	18,277
Shal Canals ...	5,549	.....	5,549	.....	.....	5,549
Pinyári ...	1,39,954	.....	1,39,954	2,873	3,758	1,46,585
Canals in Mirpur Batoro ...	21,933	.....	21,933	2	.....	21,935
Canals in Sujáwal ...	17,348	.....	17,365	17	282	17,664
Satta ...	17,964	.....	17,964	105	828	18,897
Canals in Jati ...	4,370	.....	4,370	48	73	4,491
Khanta ...	8,940	.....	8,940	67	902	9,909
Kokawari ...	28,489	.....	28,489	519	.....	29,008
Canals in Shahbandar...	4,741	.....	4,741	315	568	5,624
Bunds, left bank ...	.....	.....	.....	108	826	934
Bunds, right bank ...	1,286	.....	1,286	206	234	1,726
Begári Canals ...	3,79,107	24,856	3,54,251	63,369	68,799	4,86,419
Shikárpur Canals ...	2,68,434	.....	2,68,434	5,091	6,489	2,80,014
Ghár Canals ...	13,01,041	1,88,382	11,12,659	17,954	44,344	11,74,957
Eastern Nára Canals ...	2,03,579	3,444	2,00,135	18,038	3,295	2,21,468
Hyderabad Canals ...	6,19,942	56,041	5,63,901	15,913	83,455	6,63,269
Fuleli Canals ...	3,95,490	1,30,284	2,65,206	22,116	74,393	3,61,715
Karáchi Canals ...	5,26,228	.....	5,26,228	13,390	37,928	5,77,546
Total ...	36,93,821	4,03,007	32,90,814	1,55,871	3,18,703	37,65,388
Add Agricultural Receipts ...				925	.....	925
Total ...				1,56,796	3,18,703	37,66,313

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE VII.

Area of Cultivation and Consolidated Revenue for 1884-85.

	Canals and Districts.	Cultivation.			Consolidated Revenue.			Remissions.			Net consolidated Revenue.	Land Share, 10 per cent.	Water Share, 90 per cent.
		Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif	Rabi.	Total.			
		Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals.	Desert Canal	63,177	11,232	74,409	1,23,709	21,745	1,45,454	...	1,946	1,946	1,43,508	14,351	1,29,157
	Begári Canal	1,14,854	17,361	1,32,215	2,37,474	31,193	2,68,667	776	654	1,430	2,67,237	26,723	2,40,514
	Káshmor Bund ...	302	3,682	3,984	606	7,348	7,954	...	...	...	7,954	796	7,158
Shikárpur Canals.	Canals in Rohri ..	46,642	21,593	68,235	1,07,947	46,680	1,54,627	356	...	356	1,54,271	15,427	1,38,844
	Bunds in Rohri... ...	3,207	770	3,977	6,791	1,531	8,322	..	...	...	8,322	832	7,490
	Sind Canal	40,500	5,721	46,221	1,15,719	16,120	1,31,839	10	3	13	1,31,826	13,182	1,18,644
	Sukkur-Begári Bund ...	...	..	...	...	...	...	...	...	...	..	...	...
Ghár Canals.	Sukkur Canal	53,219	17,838	71,057	1,35,394	49,167	1,84,561	1,429	1,820	3,249	1,81,312	18,130	1,63,182
	Ghár	1,82,753	29,821	2,12,574	6,55,304	1,04,778	7,60,082	12,933	1,447	14,380	7,45,702	74,571	6,71,131
	Nára	1,04,463	27,429	1,31,892	3,48,604	1,01,595	4,50,199	9,608	315	9,923	4,40,276	44,028	3,96,248
	Wáhur	7,479	1,287	8,766	19,971	3,335	23,306	30	3	33	23,273	2,327	20,946
	Márvi	2,432	1,312	3,744	6,319	4,798	11,117	...	...	...	11,117	1,112	10,005
	Bunds, right bank ...	52	37	89	105	68	173	...	...	...	173	17	156
Eastern Nára Canals.	Nára Supply Channel ...	114	628	742	478	1,750	2,228	...	...	...	2,228	223	2,005
	Eastern Nára	4,021	6,077	10,098	9,113	13,751	22,864	8	17	25	22,839	2,284	20,555
	Mithrao Canal	65,891	7,201	73,092	1,37,637	9,608	1,47,245	41	...	41	1,47,204	14,720	1,32,484
	Thár Canal	20,546	2,630	23,176	45,673	3,918	49,591	201	...	201	49,390	4,939	44,451
	Dimwah	1,671	125	1,796	3,035	125	3,160	...	...	...	3,160	316	2,844
	Heranwah	575	11	586	893	16	909	...	...	...	909	91	818
Hyderabad Canals.	Mehrabwah	9,404	688	10,092	29,241	991	30,232	8,354	7	8,361	21,871	2,187	19,684
	Nasrat	15,150	1,126	16,276	55,483	2,492	57,975	13,363	242	13,605	44,370	4,437	39,933
	Naolákhi	41,468	4,136	45,604	1,12,685	8,790	1,21,475	6,447	147	6,594	1,14,881	11,488	1,03,393
	Dámbro	4,542	624	5,166	12,321	1,257	13,578	609	22	631	12,947	1,295	11,652
	Dád	15,306	1,927	17,233	36,839	5,724	42,563	1,711	81	1,792	40,771	4,077	36,694
	Rein	12,212	1,304	13,516	30,252	3,253	33,505	3,663	93	3,756	29,749	2,975	26,774
	Alibahr Kacheri ...	8,036	54	8,090	23,069	377	23,446	4,745	...	4,745	18,701	1,870	16,831
	Márak	40,533	693	41,226	1,07,123	1,450	1,08,573	10,130	132	10,262	98,311	9,831	84,480
	Gháro Mahmuda ...	49,842	2,566	52,408	1,08,002	6,189	1,14,191	4,816	...	4,816	1,09,375	10,938	98,437
	Kari Shumáli	27,912	394	28,306	43,731	1,025	44,756	200	...	200	44,556	4,456	40,100
	Nasir	24,140	1,129	25,269	51,779	2,594	54,373	574	...	574	53,799	5,380	48,419
	Sarfráz	18,565	951	19,516	29,535	1,896	31,431	106	6	112	31,319	3,132	28,187
	Other Canals	17,254	3,682	20,936	47,866	7,934	55,800	4,747	196	4,943	50,857	5,085	45,772
Fuleli Canals.	Fuleli	1,58,706	11,771	1,70,477	3,61,355	20,590	3,81,945	3,220	11	3,231	3,78,714	37,870	3,40,844
	Other Canals	11,824	871	12,695	33,621	1,900	35,521	15	...	15	35,506	3,551	31,955
Karáchi Canals.	Nára	39,091	34,096	73,187	96,136	92,155	1,88,291	1,109	4,465	5,574	1,82,717	18,272	1,64,445
	Phitta	3,907	1,517	5,424	7,989	3,822	11,811	...	75	75	11,736	1,174	10,562
	Canals north of Kotri ...	10,561	2,036	12,597	22,840	4,864	27,704	522	...	522	27,182	2,718	24,464
	Kalri	5,576	460	6,036	15,459	2,089	17,548	89	...	89	17,459	1,476	15,713
	Baghar	11,555	1,266	12,821	24,301	4,325	28,626	49	502	551	28,075	2,807	25,268
	Uchita	8,052	752	8,804	24,968	1,711	26,679	5,753	9	5,762	20,917	2,092	18,825
	Canals in Tatta, &c. ...	6,992	479	7,471	16,343	1,939	18,282	726	...	726	17,556	1,756	15,800
	Shal Canals	1,767	348	2,115	5,222	936	6,158	...	...	...	6,158	616	5,542
	Piny ári	53,962	2,131	56,093	1,49,232	9,273	1,58,505	781	...	781	1,57,724	15,772	1,41,952
	Canals in Mirpur Batoro.	8,711	482	9,193	25,936	1,403	27,339	840	..	840	26,499	2,650	23,849
	Canals in Sujával ...	6,131	1,004	7,135	16,595	2,380	18,975	80	...	80	18,895	1,889	17,006
	Satta	7,028	143	7,171	18,472	1,234	19,706	81	...	81	19,625	1,962	17,663
	Canals in Jati	1,502	272	1,774	4,366	518	4,884	...	...	...	4,884	488	4,396
	Khánta	5,045	162	5,207	11,050	772	11,822	1,153	...	1,153	10,669	1,067	9,602
	Kokawari	14,673	339	15,012	34,437	1,215	35,652	555	...	555	35,097	3,510	31,587
	Canals in Shábbandar ..	2,218	145	2,363	4,424	737	5,161	25	...	25	5,136	514	4,622
	Bunds, left bank ..	397	16	413	1,173	257	1,430	...	...	...	1,430	143	1,287
	Bunds, right bank ..	...	..	...	...	...	...	...	...	...	...	...	...
	Begári Canals	1,78,333	32,275	2,10,608	3,61,789	60,286	4,22,075	776	2,600	3,376	4,18,699	41,870	3,76,829
	Shikárpur Canals	90,349	28,084	1,18,433	2,30,457	64,331	2,94,788	366	3	369	2,94,419	29,441	2,64,978
	Ghár Canals	3,50,398	77,724	4,28,122	11,65,697	2,63,741	14,29,438	24,000	3,585	27,585	14,01,853	1,40,185	12,61,668
	Eastern Nára Canals	92,818	16,672	1,09,490	1,96,829	29,168	2,25,997	250	17	267	2,25,730	22,573	2,03,157
	Hyderabad Canals	2,84,364	19,274	3,03,638	6,87,926	43,972	7,31,895	59,465	926	60,391	6,71,507	67,151	6,04,356
	Fuleli Canals	1,70,530	12,642	1,83,172	3,94,976	22,490	4,17,466	3,235	11	3,246	4,14,220	41,421	3,72,799
	Karáchi Canals...	1,87,168	45,648	2,32,816	4,78,943	1,29,630	6,08,573	11,763	5,051	16,814	5,91,759	59,176	5,32,583
	Total ...	1,353,960	232,319	1,586,279	35,16,617	6,13,618	41,30,235	99,855	12,193	1,12,048	40,18,187	4,01,817	36,16,370

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

TABLE VIII.

Discharges of certain Canals, Areas of Crops of different kinds irrigated, and Duty of Water per cubic foot of Supply for Kharif Season 1884.

Canals and Executive Charges.			Average Discharge cubic foot per second.	Areas of Land irrigated.				Area of Land irrigated.		Area irrigated, comprising		Total area irrigated.	Area Irrigated per cubic foot of supply.
				Jowári.	Bájri.	Rice.	Other Crops.	By Lift.	By Flow.	Government Land.	Jaghír Land.		
				Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Upper Sind Frontier ...	Begári Canals ...	Desert Canal ...	1,581	78,292	6,930	20	10,198	...	...	92,453	2,987	95,440	72·39
		Muradwah ...	385	7,329	2,969	...	1,412	...	...	11,705	5	11,710	40·65
		Begári Canal ...	4,298	1,01,145	3,574	8,323	44,330	...	...	147,268	10,104	1,57,372	42·44
Shikárpur Collectorate...	Shikárpur Canals.	Sind Canal ...	1,398	15,464	309	20,189	4,316	...	...	...	...	40,278	28·80
	Ghár Canals	Sukkur Canal ...	1,902	16,210	270	23,135	13,603	...	...	53,218	486	53,704	28·23
		Ghar ...	4,888	20,752	849	1,53,448	7,704	...	...	1,82,753	4,543	1,87,296	38·32
Thar and Párkar ...	Eastern Nára Canals.	Mithrau Canal ...	990	110	8,872	47,340	10,268	12,402	54,188	66,590	...	66,590	67·26
Hyderabad Collectorate...	Hyderabad Canals	Mehrabwah ...	236	7,228	1,735	10	657	8,878	752	9,630	5	9,635	40·82
		Nasrat ...	385	8,860	1,492	35	1,755	8,468	3,674	12,142	313	12,455	32·35
		Naolakhi ...	1,057	25,128	5,587	240	10,329	28,741	12,543	41,284	2,285	43,569	41·22
		Márak ...	1,292	3,318	23,872	66	13,374	39,505	1,125	40,630	5,843	46,473	35·97
		Ghalu ...	925	1,205	17,204	2	9,870	28,194	87	28,281	7,461	35,742	38·64
		Nasir ...	406	2,059	13,566	...	6,587	22,212	...	22,212	1,399	23,611	58·15
		Sarfraz ...	462	539	13,406	...	4,335	17,972	308	18,280	4,491	22,771	49·28
	Fuleli Canals ...	Fuleli ...	5,999	683	40,186	114,715	12,978	53,071	1,15,491	132,962	35,600	1,68,562	28·09
		Imamwah Janabi ...	278	86	4,721	2,289	1,857	6,880	2,073	...	...	8,953	32·20
		Sanhi Guni ...	384	...	12	5,152	33	39	5,158	...	...	5,197	13·53
		Sherwah ...	101	5	61	1,830	27	88	1,835	...	...	2,923	29·94
		Aliwah ...	169	...	12	2,278	12	65	2,237	...	...	2,302	13·62

Note.—During kharíf season lands on the Desert Canal, Muradwah, and Begári Canals were flooded for rabi cultivation to the extent of 19,011, 3,942, and 25,057 acres respectively, so that the duty noted against them is for these areas also.

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind

TABLE IX.

Rainfall in the Province of Sind for 1884-85.

Collectorates and Tálukas.			April.	May.	June.	July.	August.	September.	October.	November.	December.	January..	February.	March.	Total.
			In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Frontier, Upper Sind.		Kashmor	0·36	...	...	0·14	1·82	5·13	...	...	...	0·62	...	0·37	8·44
		Thul ...	0·06	...	...	1·85	3·62	1·95	...	...	...	0·63	...	0·40	8·51
		Jacobabad	0·04	0·01	...	4·27	4·04	0·79	...	...	...	1·03	...	0·30	10·48
		Shahdádpur	0·08	...	0·39	0·94	4·69	0·63	...	...	...	0·55	...	0·38	7·66
Shikárpur Collectorate.	Shikárpur Canals.	Ubauro	0·12	...	...	2·93	2·11	5·33	...	...	...	0·10	...	0·20	10·79
		Mirpur	0·08	0·16	...	2·29	1·93	8·26	...	...	...	0·15	...	...	12·87
		Ghotki	0·11	...	...	1·46	3·60	5·05	...	...	...	0·28	...	...	10·50
		Rohri	0·16	...	...	1·35	2·96	1·88	...	...	...	0·14	...	...	6·49
		Shikárpur	0·05	0·12	...	3·24	3·66	2·25	...	...	...	0·36	...	0·01	9·69
		Sukkur	...	0·20	...	3·68	4·95	2·09	..	...	...	0·16	...	...	11·08
		Garhi Yásin	...	...	...	2·57	3·70	1·64	..	...	...	0·37	...	...	8·28
	Ghár Canals.	Ratodero	0·20	..	...	1·95	3·40	1·26	...	...	...	...	...	...	6·81
		Lárkhána	..	0·33	...	0·89	4·03	1·27	...	...	...	0·71	...	...	7·23
		Kambar	...	...	...	1·18	4·11	0·95	...	...	...	0·05	...	...	6·29
		Bákráni	...	0·15	...	1·20	4·98	1·60	...	...	...	0·58	...	...	8·51
		Mehar	...	...	0·99	2·65	1·40	1·43	...	...	...	0·86	...	...	7·33
		Tharri Mohbat	...	...	...	1·68	2·62	2·00	...	...	...	...	...	...	6·30
		Wára	...	...	...	2·00	1·75	1·01	...	...	...	0·75	...	...	5·51
		Khairpur Nátheshah	...	0·04	...	2·92	2·49	1·60	...	...	...	0·59	...	...	7·64
Thar and Párkar.	Eastern Nára Canals.	Khipra	...	...	0·25	2·61	5·55	1·12	...	...	...	0·12	...	...	9·65
		Umarkot	...	0·18	1·95	5·89	4·19	2·51	...	...	...	0·33	...	...	15·05
		Mitti	...	...	0·19	8·92	2·02	2·92	...	...	...	0·05	...	...	14·10
		Nagar	...	...	1·65	13·41	6·12	3·63	...	...	...	...	...	...	24·81
Hyderabad Collectorate.	Hyderabad Canals.	Kandiáro	...	...	...	3·00	2·70	...	...	...	...	0·30	...	...	6·00
		Nausháhro	...	...	...	5·00	1·43	...	...	...	...	0·10	...	...	6·53
		Tháru Sháh	...	...	...	2·51	2·73	1·71	...	...	...	0·35	...	0·15	7·45
		Moro	...	...	0·34	3·93	1·85	...	...	...	...	...	...	...	6·12
		Sákrand	...	...	...	2·76	3·35	...	...	...	...	0·12	...	...	6·23
		Hála	...	...	...	2·46	4·90	1·85	...	...	...	1·09	...	...	10·30
		Shahdadpur	...	...	...	2·34	4·53	...	...	...	...	0·40	...	...	7·27
		Tando Adam	...	...	1·40	1·80	4·16	1·73	...	...	...	0·65	...	...	9·74
		Tando Alahyar	...	...	...	2·51	3·96	2·20	...	...	...	0·46	...	...	9·13
		Mirpur Khás	...	...	1·30	4·35	5·52	...	...	...	...	0·39	...	0·01	11·57
	Fuleli Canals.	Hyderabad..	0·05	...	0·02	1·20	3·67	3·33	...	...	...	0·27	...	...	8·54
		Dero Mohbat	...	...	1·28	3·54	2·79	...	...	...	...	0·42	...	...	8·03
		Tando Bágo	...	...	2·22	8·48	3·30	1·51	...	...	...	0·27	...	...	15·78
		Badin	...	...	1·16	3·92	3·20	2·21	...	...	...	0·25	...	...	10·74
		Guni	...	...	0·04	2·34	2·50	1·72	...	...	...	1·11	...	...	7·71
Karáchi Collectorate.	Karáchi Canals.	Dádu	...	...	0·96	1·92	1·76	1·19	...	...	...	0·32	...	0·26	6·41
		Jáhi...	...	...	0·60	1·44	1·20	1·81	...	...	...	0·25	...	0·32	5·62
		Sehwan	...	...	3·00	2·10	2·03	0·40	...	...	...	0·33	...	0·04	7·90
		Mánjhand	...	...	1·00	4·46	4·20	0·64	...	...	...	0·50	..	...	10·80
		Kotri	...	...	0·70	1·61	3·01	2·73	...	...	...	0·46	...	...	8·51
		Bula Khán	...	...	0·15	2·92	0·94	2·90	...	...	...	1·20	...	...	8·11
		Jerruck	...	...	0·55	4·31	2·20	2·55	...	...	...	1·08	...	...	10·69
		Tatta	...	...	0·22	2·55	0·97	1·28	...	...	...	0·80	...	...	5·82
		Sákro	...	...	3·45	4·55	3·04	1·58	..	...	...	0·80	...	0·05	13·47
		Mirpur Batoro	...	...	0·37	2·10	2·44	1·19	...	...	...	0·56	...	...	6·66
		Sujáwal	...	...	0·56	2·69	1·90	1·37	...	...	...	0·55	...	...	7·07
		Shahbandar	...	...	0·25	9·34	1·53	1·75	...	...	...	0·34	...	0·10	13·31
		Kotri Ghorábári	...	..	0·44	5·22	1·84	0·71	...	...	...	0·59	...	0·04	8·84
		Keti...	...	...	0·19	5·84	1·44	2·36	...	...	...	0·37	...	0·11	10·31
		Mugalbin	...	...	1·63	6·85	3·18	1·77	...	...	...	0·16	...	...	13·59
		Karáchi	...	...	...	3·66	0·29	2·89	...	...	...	1·78	...	0·22	8·84

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

	WORKS IN									
	PRODUCTIVE PUBLIC WORKS.					IRRIGATION AND NAVIGATION, ORDINARY—WORKS FOR WHICH CAPITAL				
	Desert Canal.	Unharwah.	Begári Canal.	Eastern Nára Works.	Total.	Sukkur Canal.	Ghár Canal.	Mehrabwah.	Alibhar Kacheri Canal.	Márak Great Canal.
Capital Outlay.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
During year ... Direct ...	48,087	1,72,677	86,539	3,24,244	6,31,547	25,627	.....	382	...	...
During year ... Indirect ...	828	2,964	1,490	6,276	11,558	591	... .	11	...	405
Total ...	48,915	1,75,641	88,029	3,30,520	6,43,105	26,218	.....	393	...	405
To end of year ... Direct ...	10,67,737	1,77,148	15,58,331	43,66,880	71,70,096	13,26,237	4,15,537	66,018	23,207	1,93,600
To end of year ... Indirect ...	37,029	3,476	45,997	1,66,199	2,52,701	59,908	25,440	1,851	710	7,953
Total ...	1,104,766	1,80,624	16,04,328	45,33,079	74,22,797	13,86,145	4,40,977	67,869	23,917	2,01,553
Gross Revenue.										
During year ... Direct ...	28,650	...	34,561	18,038	81,2 49	593	6,744	5	289	2,561
During year ... Indirect ...	1.20,398	...	2,26,695	2,00,135	5,47,228	97,701	5,72,898	20,732	8,082	62,590
Total ...	1,49,048	...	2,61,256	2,18,173	6,28,477	98,294	5,79,642	20,737	8,371	65,151
To end of year ... Direct ...	71,995	...	1,38,565	4,90,541	7,01,101	8,523	1,68,618	268	8,997	39,421
To end of year ... Indirect ..	10,83,908	...	28,06,032	35,40,954	74,30,894	5,71,901	99,07,238	35,097	74,839	5,58,772
Total ...	11,55,903	...	29,44,597	40,31,495	81,31,995	5,80,424	1,00,75,856	35,365	83,836	5,98,193
Working Expenses.										
During year ... Direct ...	43,549	...	81,185	86,216	2,10,950	32,282	1,85,584	17,197	8,624	19,250
During year ... Indirect ...	1,093	...	1,869	2,801	5,763	509	2,879	384	198	316
Total ...	44,642	...	83,054	89,017	2,16,713	32,791	1,88,463	17,581	8,822	19,566
To end of year ... Direct ...	3,02,262	...	15,56,417	20,62,673	39,21,352	6,76,056	25,94,826	29,511	75,345	2,01,725
To end of year ... Indirect ...	9,047	...	43,110	94,920	1,47,077	21,395	59,361	693	2,341	5,347
Total ...	3,11,309	...	15,99,527	21,57,593	40,68,429	6,97,451	26,54,187	30,204	77,686	2,07,072
Net Revenue.										
During year	1,04,406	...	1,78,202	1,29,156	4,11,764	65,503	3,91,179	3,156	—451	45,585
To end of year	8,44,594	...	13,45,070	18,73,902	40,63,566	—1,17,027	74,21,669	5,161	6,150	3,91,121
Simple Interest.										
During year	41,748	3,632	60,602	1,68,190	2,74,172	...	.....	—	...	...
To end of year	3,52,481	3,632	8,30,342	29,91,392	41,77,847	...	.....	...	...	...
Net profit after paying off Interest.										
During year	62,658	-3,632	1,17,600	-39,034	1,37,592	...	.....	...	...	...
To end of year	4,92,113	-3,632	5,14,728	--11,17,490	—1,14,281	...	.....	...	...	...

Notes.—

(1) Direct outlay under Working Expenses includes share of cost of collection in the Civil Department.

(2) Interest charges on account of works other than Productive Public Works are not shown, per Government of India's Circular No. IV. P. W. of 1st May 1884 communicated in G. R. No. 223 dated 23rd idem.

Works in Sind for and up to the close of 1884-85.

OPERATION.

AND REVENUE ACCOUNTS ARE KEPT.			Grand Total.	IRRIGATION AND NAVIGATION, ORDINARY—WORKS FOR WHICH ONLY REVENUE ACCOUNTS ARE KEPT.					
Sarfrazwah.	Fuleli Canal.	Total.		Under Executive Engineer, Shikárpur Canals.	Under Executive Engineer, Ghár Canals.	Under Executive Engineer, Hyderabad Canals.	Under Executive Engineer, Fuleli Canals.	Under Executive Engineer, Karáchi Collectorate Canals.	Total.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
...	...	26,009	6,57,556	...	...	...	...	...	...
...	...	1,007	12,565	...	...	...	...	...	...
...	...	27,016	6,70,121	...	...	...	...	...	...
1,18,559	9,30,232	30,73,390	1,02,43,486	...	...	...	...	...	..
6,121	33,243	1,35,226	3,87,927	...	...	...	...	...	...
1,24,680	9,63,475	32,08,616	1,06,31,413	...	...	...	...	...	...
982	21,851	33,025	1,14,274	5,091	10,617	12,076	265	13,390	41,439
16,384	2,27,752	10,06,139	15,53,267	2,68,434	4,44,374	4,56,113	37,454	5,23,914	17,30,289
17,366	2,49,603	10,39,164	16,67,641	2,73,525	4,54,991	4,68,189	37,719	5,37,304	17,71,728
22,951	4,64,708	7,13,486	14,14,587	...	...	...	...	...	...
1,24,017	40,82,174	1,53,54,038	2,27,84,932	...	...	...	...	...	...
1,46,968	45,46,882	1,60,67,524	2,41,99,519	...	...	...	...	...	...
12,071	2,07,020	4,82,028	6,92,978	1,63,404	1,44,764	1,94,711	25,734	3,08,552	8,37,165
263	5,269	9,818	15,581	...	...	...	...	...	...
12,334	2,12,289	4,91,846	7,08,559	1,63,404	1,44,764	1,94,711	25,734	3,08,552	8,37,165
1,38,889	33,14,032	70,30,384	1,09,51,736	...	...	...	...	...	...
5,532	1,04,380	1,99,049	3,46,126	...	...	...	...	...	...
1,44,421	34,18,412	72,29,433	1,12,97,862	...	...	...	...	...	...
5,032	37,314	5,47,318	9,59,082	1,10,121	3,10,227	2,73,478	11,985	2,28,752	9,34,563
2,547	11,28,470	88,38,091	1,29,01,657	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...

Expenditure on and Receipts from Agricultural Works for which Capital and Revenue Accounts are not kept.

	Expenditure.	Receipts.
Begári Canals.	Rs.	Rs.
Kashmor Bund.		
Maintenance and conservancy of Kashmor Bund .	36,284	
Maintenance of garden at Badani	480	
Rent of Telegraph line and office at Badani ...	1,800	
Maintenance of Buxaliwah	222	
General charges for Establishment and Tools and Plant	5,748	
Share of collection charges in the Civil Department .	716	
	45,250	158
Add—Irrigation share of Land Revenue	...	7,158
Total Begári Canals ...	45,250	7,316
Shikárpur Canals.		
Maintenance of Kasimpur Bund	3,486	
General charges for Establishment and Tools and Plant	351	
Total Shikárpur Canals ..	3,837	11
Ghar Canals	...	7
Eastern Nára District ...	...	8
Karáchi Collectorate Canals.		
Constructing sluices on forest canals in Sháhbandar District ...	5,712	
General charges for Establishment and Tools and Plant	1,428	
Total Karáchi Collectorate Canals ...	7,140	
Mathematical Instrument Depôt in Sind	—296	
Superintending Engineer in Sind	4	3
Grand Total ...	55,935	7,345

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

P. LAMBERT, Col., R.E.,
Examiner of Public Works Accounts.

STATEMENT No. I.c.

Statement showing Financial Results of Irrigation Works in Sind for the year ending 31st March 1885.

Realizations under main heads of Revenue and Working Expenses.

Irrigation Works.	Revenue (actual Receipts.)										Working Expenses.																Net Revenue.
	Irrigation.			Navigation.	Plantations and Land.	Water power.	Miscellaneous.	Total.	Refunds of Revenue.	Gross Revenue, less Refunds.	Revenue Management.					Maintenance of Works.									Indirect Charges.	Grand Total Working Expenses.	
											Establishment.				Total Revenue Management.	Establishment.				Works.	Repairs.	Sundries.	Tools and Plant.	Plantations.	Total cost of Maintenance.			
	Water rates directly paid.	Share of Land Revenue.	Total.								Direction.	Executive.	Navigation.	Civil Officers.		Direction.	Executive.	Medical.	Total.								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Productive Public Works.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Desert Canal	28,463	1,20,398	1,48,861	..	32	..	155	1,49,048	..	1,49,048	..	1,653	..	12,063	13,716	1,524	4,631	..	6,155	..	23,158	...	520	..	29,833	1,093	44,642	1,04,406
Begári do.	33,982	2,26,695	2,60,677	..	207	..	372	2,61,256	..	2,61,256	..	1,653	..	22,835	24,488	2,896	8,803	..	11,699	..	44,681	..	317	..	56,697	1,869	83,054	1,78,202
Eastern Nára Works	699	2,00,135	2,00,834	..	1,829	..	16,010	2,18,173	53	2,18,120	1,404	8,328	..	21,337	31,069	1,502	8,774	..	10,276	..	44,160	..	658	..	55,094	2,801	88,964	1,29,156
Total ..	63,144	5,47,228	6,10,372	..	1,568	..	16,537	6,28,477	53	6,28,424	1,404	11,634	..	56,235	69,273	5,922	22,208	..	28,130	..	1,11,999	..	1,495	..	1,41,624	5,763	2,16,660	4,11,764
Ordinary Irrigation Works.																											
Sukkur Canal	136	97,701	97,837	..	92	..	365	98,294	..	98,294	..	..	..	9,789	9,789	1,228	2,407	..	3,635	..	18,463	..	181	214	22,493	509	32,791	65,503
Ghár do.	1,930	5,72,898	5,74,828	..	1,383	..	3,431	5,79,642	78	5,79,564	..	..	..	57,717	57,717	6,948	13,617	..	20,565	31,993	74,947	..	284	..	1,27,789	2,879	1,88,385	3,91,179
Mehrabwah	..	20,732	20,732	..	5	..	..	20,737	..	20,737	..	..	..	2,073	2,073	815	1,925	..	2,740	..	12,384	..	..	..	15,124	384	17,581	3,156
Alibhar Kacheri Canal	276	8,082	8,358	..	13	..	..	8,371	..	8,371	..	..	..	836	836	420	991	..	1,411	..	6,377	..	..	..	7,788	198	8,822	−451
Márak Great do.	2,409	62,590	64,999	20	132	..	..	65,151	23	65,128	..	..	..	6,500	6,500	689	1,568	..	2,257	640	9,830	..	..	..	12,727	316	19,543	45,585
Surfrazwah	790	16,384	17,174	..	125	..	67	17,366	..	17,366	..	..	..	1,717	1,717	558	1,318	..	1,876	..	8,478	..	..	..	10,354	263	12,334	5,032
Fuleli Canal	17,502	2,27,752	2,45,254	651	1,317	..	2,381	2,49,603	103	2,49,500	..	..	..	24,525	24,525	9,494	28,139	..	37,633	..	1,44,283	..	476	..	1,82,392	5,269	2,12,186	37,314
Total ..	23,043	10,06,139	10,29,182	671	3,067	..	6,244	10,39,164	204	10,38,960	..	..	..	1,03,157	1,03,157	20,152	49,965	..	70,117	32,633	2,74,762	..	941	214	3,78,667	9,818	4,91,642	5,47,318
Grand Total ..	86,187	15,53,367	16,39,554	671	4,635	..	22,781	16,67,641	257	16,67,384	1,404	11,634	..	1,59,392	1,72,430	26,074	72,173	..	98,247	32,633	3,86,761	..	2,436	214	5,20,291	15,581	7,08,302	9,59,082

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

P. LAMBERT, Colonel, R.E.,
Examiner of Public Works Accounts.

STATEMENT No. IIc.

Statement showing the Financial Results of Irrigation Works in Sind for the year ended 1884-85 based on actual receipts.
Principal results of operations for the year ended 31st March 1885.

Irrigation Works.	Direct and Indirect Capital outlay to end of 1884-85.	Gross Receipts, Direct and Indirect, from all sources.	Working expenses, Direct and Indirect	Net Revenue (excluding charges for Interest.)	Interest at 4 per cent on direct Capital Outlay at commencement of year and at 2 per cent on outlay during year.	Surplus Revenue after paying Interest on Direct Capital Outlay.		Excess charge including Interest on direct Capital Outlay.	
						Amount.	Percentage on total sum at charge.	Amount.	Percentage on total sum at charge.
1	2	3	4	5	6	7	8	9	10
Productive Public Works.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
In operation.									
Desert Canal	11,04,766	1,49,048	44,642	1,04,406	41,748	62,658	5·67	.....	.....
Begári do.	16,04,328	2,61,256	83,054	1,78,202	60,602	1,17,600	7·33	.....	.....
Eastern Nára Works	45,33,079	2,18,120	88,964	1,29,156	1,68,190	.....	.....	39,034	·86
	72,42,173	6,28,424	2,16,660	4,11,764	2,70,540	1,41,224	1·95	.....	.....
In progress.									
Unharwah...	1,80,624	.....	.....	.....	3,632	.....	.....	.....	.....
Total Productive Public Works ...	74,22,797	6,28,424	2,16,660	4,11,764	2,74,172	.....	.....	.....	.....
Ordinary Irrigation Works.									
In operation.									
Sukkur Canal	13,86,145	98,294	32,791	65,503	52,537	12,966	·94	.....	.....
Ghár do.	4,40,977	5,79,564	1,88,385	3,91,179	16,621	3,74,558	84·94	.....	.....
Mehrabwah	67,869	20,737	17,581	8,156	2,633	523	·77	.....	.....
Alibhar Kacheri Canal	23,917	8,371	8,822	—451	928	.....	.....	1,379	5·77
Márak Great do.	2,01,553	65,128	19,543	45,585	7,744	37,841	18·77	.....	.....
Surfrazwah	1,24,680	17,366	12,334	5,032	4,742	290	·23	.....	.....
Fuleli Canal	9,63,475	2,49,500	2,12,186	37,314	37,209	105	·01	.....	.....
Total Ordinary Irrigation Works ...	32,08,616	10,38,960	4,91,642	5,47,318	1,22,414	4,24,904	13·24	.....	.....

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

P. LAMBERT, Colonel, R.E.,
Examiner of Public Works Accounts.

STATEMENT No. IIIc.

Demands and Realizations during the year 1884-85 in Sind.

	Balance of demands unrealized at commencement of year.	Demands of the year.	Total.	Deduct Remissions not including cash refunds.	Net Total.	Deduct amount unrealized at close of year.	Actual Receipts of the year.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Public Works.							
Desert Canal	44,004	33,734	77,738	.....	77,738	49,088	28,650
Begári do.	52,481	39,803	92,284	.....	92,284	57,723	34,561
Eastern Nára Works	.....	18,039	18,039	.....	18,039	1	18,038
Total ...	96,485	91,576	1,88,061	.....	1,88,061	1,06,812	81,249
Ordinary Irrigation Works.							
Sukkur Canal	31	756	787	.....	787	194	593
Ghár do.	669	6,932	7,601	40	7,561	817	6,744
Mehrabwah	.....	5	5	.....	5	.....	5
Alibhar Kacheri Canal	283	313	596	.....	596	307	289
Márak Great do.	1,685	2,995	4,680	.....	4,680	2,119	2,561
Surfrazwah	1,014	1,273	2,287	.....	2,287	1,305	982
Fuleli Canal	12,609	21,034	33,643	.....	33,643	11,792	21,851
Total ...	16,291	33,308	49,599	40	49,559	16,534	33,025
Grand Total ...	1,12,776	1,24,884	2,37,660	40	2,37,620	1,23,346	1,14,274

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

P. LAMBERT, Colonel, R.E.,
Examiner of Public Works Accounts.

STATEMENT No. IVc.

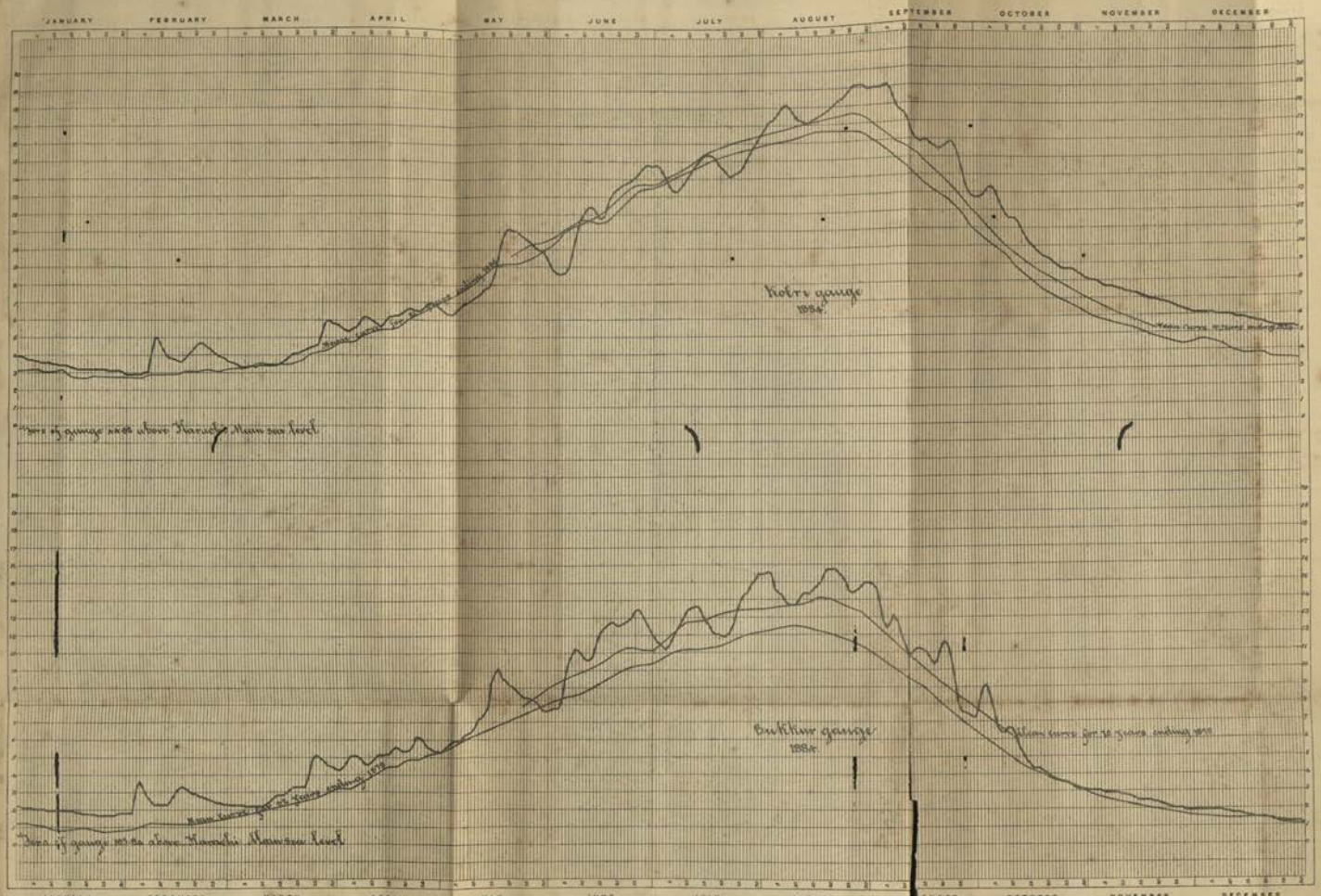
Statement showing the Financial Results of Irrigation Works in Sind for the year ended 1884-85 based on assessments of the year. Principal Results of Operations for the year ended 31st March 1885.

Irrigation Works.	Capital outlay (direct and indirect) to end of year.	Revenue assessed during the Year.									Working expenses, Direct and Indirect.	Net assessed revenue of the year.	Percentage on Capital outlay to end of year.
		Direct Assessed Revenue.							Indirect Revenue, Land Revenue due to operation of Canal.	Grand Total.			
		Occupier's Rate.	Owner's Rate.	Plantations.	Water-power.	Navigation.	Miscellaneous.	Total.					
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Productive Public Works.													
Desert Canal...	11,04,766	33,547	...	32	...	...	155	33,734	1,29,157	1,62,891	44,642	1,18,249	10·70
Begári do.	16,04,328	39,224	...	207	...	...	372	39,803	2,15,658	2,55,461	83,054	1,72,407	10·75
Eastern Nára Works	45,33,079	700	...	1,329	...	...	16,010	18,039	1,99,714	2,17,753	88,964	1,28,789	2·84
Total ...	72,42,173	73,471	...	1,568	...	...	16,537	91,576	5,44,529	6,36,105	2,16,660	4,19,445	5·79
Ordinary Irrigation Works.													
Sukkur Canal	13,86,145	299	...	92	...	...	365	756	91,632	92,388	32,791	59,597	4·30
Ghár do.	4,40,977	2,118	...	1,383	...	...	3,431	6,932	5,54,299	5,61,231	1,88,385	3,72,846	84·55
Mehrabwah	67,869	...	...	5	...	...	.....	5	19,684	19,689	17,581	2,108	3·11
Alibhar Kacheri Canal	23,917	300	...	13	...	...	.....	313	8,404	8,717	8,822	—105	·44
Márak Great Canal	2,01,553	2,843	...	132	...	20	.....	2,995	52,021	55,016	19,543	35,473	17·60
Surfrazwah	1,24,680	1,081	...	125	...	...	67	1,273	17,032	18,305	12,334	5,971	4·79
Fuleli Canal	9,63,475	16,685	...	1,317	...	651	2,381	21,034	2,10,559	2,31,593	2,12,186	19,407	2·01
Total ...	32,08,616	23,326	...	3,067	...	671	6,244	33,308	9,53,631	9,86,939	4,91,642	4,95,297	15·44
Grand Total ...	1,04,50,789	96,797	...	4,635	...	671	22,781	1,24,884	14,98,160	16,23,044	7,08,302	9,14,742	8·75

J. E. WHITING, M.A., M.I.C.E.,
Acting Superintending Engineer for Irrigation in Sind.

P. LAMBERT, Colonel, R.E.,
Examiner of Public Works Accounts.

BOMBAY: PRINTED AT THE GOVERNMENT CENTRAL PRESS.



Sectional Paper to register the rise and fall of rivers &c. Supplied by the Geographical Branch of the Public Works Department, India Office, London.

J. E. Whiting M.I.C.E.
Superintending Engineer for Irrg.
in Sind.

Temple dera
Jhatpat
Shikarpur
Sukkur
Rohri
Khairpur
Kot Diji
Jamrao
Kot Imamgarh
Nasirabad
Kandiaro
Kakar
Pulji
Johi
Mehar
Chinna
Shah Hasan
Lakhi
Sakrand
Manjhand
Shah Bilawal
Sonmiani
Karachi
Cape Monze
Haidarabad
Kotri
Badin
Mirpur
Umarkot
Nabisar
Chachro
Desert Canal
Rice Canal
Lower Sind Canal
Upper Sind Canal
Nara Canal
Begari
Shikarpur
Jacobabad
Sangrar
Kashmor
Ubaro
Mirpur
Thatha
Jamrao
Sanjar
Kipra
Sindri
Mirpur
Nabisar
Thula
Talhar
Mir
Yasin
Manik
Jhurak
Mohabatdero
Mahr Khan ka Tando
Tando Rahim
Tando Adam
Tando Allahyar
Hyderabad
Kotri
Sehwan
Kohistan
Lak
Mekran
Coast
Hills
Desert
Sandy Desert
Lowlands
Alluvial Plain
Indus
Sutlej
Ghaibi dero
Nasirabad
Kandiaro
Kakar
Pulji
Johi
Mehar
Chinna
Shah Hasan
Lakhi
Sakrand
Manjhand
Shah Bilawal
Sonmiani
Karachi
Cape Monze
Haidarabad
Kotri
Badin
Mirpur
Umarkot
Nabisar
Chachro

INDEX MAP

of the

PROVINCE OF SIND

to accompany Canal Revenue Report

Scale 16 Miles to an Inch.

Note.- Roads ruled as far as possible in straight lines
Boundaries of Canal Districts shown in dotted lines

Karachi 18th September 1880.

(Signed) J. E. Whitney, C.E.
Ag. Supty. Engineer for Irrigation in Sind.

Govt. Photozinco Office, Poona, 1885.

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1885-86.

BOMBAY BRANCH
OF THE
Royal Asiatic Society.
CLASS

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1885-86.

ROYAL ASIATIC

B 1024

INDEX.

	Pages.
General review of the results for the whole Province of Sind ...	1 to 5
Begári Canals	5 & 6
Shikárpur Canals	7
Ghar Canals	7 & 8
Eastern Nára Canals	8 & 9
Hyderabad Canals...	9 & 10
Fuleli Canals	10
Karáchi Canals	10 & 11
Letter from the Superintending Engineer for Irrigation in Sind, No. 2603, dated 14th December 1886	12
Memorandum from the Commissioner in Sind, No. 4928, dated 20th December 1886	12 & 13
Tables I. to IX.	14 to 22
General Abstract of Financial Results for and up to the close of 1885-86	24 & 25
Memorandum of loss to Canals on account of difference between assessments of water-rates on Jághír lands and the assessments at the ordinary rates in force for Government lands	26
Statements Nos. I B., I C., II C., III C. and IV C.	27 to 31
Chart showing readings at Kotri and Bukkur Gauges for 1885.	
Index Map of the Province of Sind.	

ANNUAL REVENUE REPORT

OF THE

IRRIGATION DEPARTMENT IN SIND FOR 1885-86.

The annual rise of the Indus commenced earlier than usual, and by the 7th of April the gauge reading exceeded the maximum of any year since 1860 on that date. From this until the middle of June the river was very unsteady, rising and falling constantly. Throughout July the river rose steadily, and with the exception of ten days in the middle of August maintained a height which satisfied perfectly all the requirements of irrigation till the final fall commenced on the 5th September. The rise in April was very sudden, and the slight falls in June and August did some little damage, but the inundation on the whole was exceptionally good, and compares favourably with any of the last ten years. The rainfall during the five months from May to September was very small; but as cultivation in Sind depends entirely on the Indus, the amount of rainfall is of no consequence except as regards damage done to the crops.

2. The area of cultivation and irrigation share of net consolidated assessment, omitting the cultivation and revenue on jágír land, was as shown below:—

TABLE A.

Years.	Area of Cultivation.			Irrigation Share of net Consolidated Assessment.
	Kharíf.	Rabi.	Total.	
	Acres.	Acres.	Acres.	Rs.
1880-81	1,172,384	156,278	1,328,662	28,43,067
1881-82	1,260,108	158,821	1,418,929	32,28,947
1882-83	1,281,691	226,601	1,508,292	32,02,048
1883-84	1,197,513	164,594	1,362,107	31,68,358
1884-85	1,353,960	232,319	1,586,279	36,16,370
Average	1,253,131	187,723	1,440,854	32,11,758
1885-86	1,288,855	243,867	1,532,722	34,33,190
Difference	+35,724	+56,144	+91,868	+2,21,432

The areas of both kharíf and rabi are above the average of the previous five years, though less than in 1884-85; but this was principally due to the failure of the supply in the Ghár, owing to the encroachment of the river on the mouth at Madeji, and the carrying away of the Fordwah sluice by the river at the end of July. The table below shows the area of cultivation and irrigation share of net consolidated assessment for 1885-86 as compared with the year 1884-85, in which the canal revenue was a maximum:—

TABLE B.

Canal Districts.	1884-85.		1885-86.		Results.	
	Cultivation, Kharíf and Rabi.	Irrigation Share of net Consolidated Assessment.	Cultivation, Kharíf and Rabi.	Irrigation Share of net Consolidated Assessment.	Cultivation, Kharíf and Rabi.	Irrigation Share of net Consolidated Assessment.
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
Begári Canals	210,608	3,76,829	219,615	4,10,224	+9,007	+33,395
Shikárpur Canals	118,433	2,64,978	113,945	2,81,037	−4,488	+16,059
Ghár Canals	428,122	12,61,668	355,807	10,14,958	−72,315	−2,46,710
Eastern Nára Canals	109,490	2,03,157	120,603	2,17,190	+11,113	+14,033
Hyderabad Canals	303,638	6,04,356	300,939	5,93,303	−2,699	−11,053
Fuleli Canals	183,172	3,72,799	186,402	3,92,485	+3,230	+19,686
Karáchi Canals	232,816	5,32,583	235,411	5,23,993	+2,595	−8,590
Total ...	1,586,279	36,16,370	1,532,722	34,33,190	−53,557	−1,83,180

The Begári Canals, Shikárpur Canals, Eastern Nára Canals and Fuleli Canals show an increase, while the Ghár Canals show a falling off of 72,315 acres of cultivation and of Rs. 2,46,710 of net consolidated assessment. The causes of this serious decrease will be explained more fully in the body of the report.

3. The net canal revenue, made up of the Irrigation share of net consolidated assessments and hakába from jághírs and miscellaneous receipts, for the several irrigation charges in the Province, as compared with the figures for the previous five years, is shown below :—

TABLE C.

Years.	Begári Canals.	Shikárpur Canals.	Ghár Canals.	Eastern Nára Canals.	Hyderabad Canals.	Fuleli Canals.	Karáchi Canals.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1880-81	1,91,186	2,01,920	8,52,004	2,08,468	5,66,958	3,82,634	5,40,862	29,44,032
1881-82	2,65,078	2,40,293	10,99,398	1,75,404	5,94,086	4,03,576	5,67,906	33,45,741
1882-83	3,59,321	2,33,721	11,89,426	1,42,283	5,91,206	3,64,535	4,58,352	33,38,844
1883-84	3,41,953	2,12,270	11,23,953	1,85,596	5,48,060	4,21,324	4,73,896	33,07,052
1884-85	4,40,198	2,70,080	12,79,629	2,21,203	6,20,269	3,94,915	5,46,872	37,73,166
Average	3,19,547	2,31,656	11,08,885	1,86,591	5,84,115	3,93,396	5,17,577	33,41,767
1885-86	4,63,288	2,89,029	10,32,725	2,35,913	6,06,280	4,12,246	5,37,860	35,77,341
Difference	+1,43,741	+57,373	−76,160	+49,322	+22,165	+18,850	+20,283	+2,35,574

It will be seen that there has been an increase in every district but the Ghár, the net increase for the whole Province being Rs. 2,35,574. As compared with the previous year the decrease in the net canal revenue is Rs. 1,95,825, the decrease in the Ghár Canals being Rs. 2,46,904.

4. The details of the area of cultivation and hakába levied on jághírs and on land in Khelat territory are shown below :—

TABLE D.

Districts.	Area of cultivation during the year.	Unrealized Balance at end of the year.	Assessment of the year.		Total.	Remissions during the year.	Net Total realizable.	Actual Realizations during year.	Balance outstanding at end of year.
			Acres.	Amount.					
	Acres.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Khelat	59,911	1,05,079	59,911	60,155	1,65,234	17,065	1,48,169	48,000	1,00,169
Upper Sind Frontier	1,737	188	1,737	764	953	..	953	284	669
Shikárpur	34,820	4,025	34,820	14,708	18,733	4	18,729	16,916	1,813
Thar and Párkar	569	....	569	272	272	..	272	272	..
Hyderabad	94,396	20,180	94,396	33,121	53,301	2	53,299	25,988	27,311
Karáchi	15,764	1,106	15,764	4,783	5,889	..	5,889	4,527	1,362
1885-86	207,197	1,30,578	207,197	1,13,802	2,44,382	17,071	2,27,311	95,987	1,31,324
1884-85	196,897	1,20,378	196,897	1,16,637	2,73,015	347	2,36,668	1,06,090	1,30,578
Difference ..	+10,300	+10,200	10,300	−2,835	−28,633	+16,724	−9,357	−10,103	+746

The principal part of the balance outstanding at the end of the year is again due by the Khelat State, and during the year only about Rs. 5,000 of the balance due was recovered. The Political Agent, South-Eastern Beluchistán, has however reported that between April and September of the current financial year a sum of Rs. 31,000 has been recovered, leaving a balance due of Rs. 69,168, which he has directed the Náib of His Highness the Khán to collect and credit to the Government treasury without delay. The remissions shown against the Khelat State are for 1884-85. The other figures in the table do not call for any remark.

5. The direct and indirect receipts of canal revenue are shown in Tables VI. and VI A. attached to the report. The totals for collection and the actual realizations during the year are shown in the table below :—

TABLE E.

Districts.	Total for collection.	Actual realizations.	Balance outstanding.	Irrigation share of collection.
	Rs.	Rs.	Rs.	Rs.
Upper Sind Frontier	4,76,752	4,64,187	12,565	4,17,769
Shikárpur	14,88,351	14,51,813	36,538	13,06,631
Thar and Párkar	2,22,480	2,21,285	1,195	1,99,157
Hyderabad	11,84,863	11,45,417	39,446	10,30,875
Karáchi	6,27,319	5,92,701	34,618	5,33,431
Total ...	39,99,765	38,75,403	1,24,362	34,87,863

The outstandings for each collectorate and district are comparatively speaking small and are very little more than half what they were at the end of the previous year.

6. The remissions for 1885-86 and for the six previous years are shown below for each irrigation district separately:—

TABLE F.

Districts.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.	Average.	1885-86.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	213	1,955	...	...	4,685	3,376	1,705	10,708
Shikárpur Canals	691	1,415	58	842	6,814	369	1,698	123
Ghár Canals	4,214	12,198	9,268	66,818	17,312	27,585	22,898	1,12,111
Eastern Nára Canals	1,762	2,928	2,504	13,476	910	267	3,641	4,413
Hyderabad Canals	58,005	20,216	911	18,817	493	60,391	26,472	2,757
Fuleli Canals	929	2,622	2,917	5,248	1,036	3,246	2,667	1,413
Karáchi Canals	32,159	23,423	19,194	1,06,505	61,621	16,814	43,286	24,891
Total ...	97,973	64,757	34,852	2,11,706	92,871	1,12,048	1,02,367	1,56,416

The average for the six previous years is swollen by the entry against Hyderabad Canals of Rs. 60,391 for 1884-85, nearly the whole of this sum being on account of the assessment on fallow numbers, and not due in any way to deficiency of the water-supply. The greater part of the remissions for the year was given on the Ghár Canals on account of the failure of the supply.

7. The expenditure on maintenance and repairs of all the canals in the Province on Public Works establishment and on collection is shown below :—

TABLE G.

Years.	Maintenance and Repairs.			Revenue Collection Charges.	Total.
	Works.	Establishment.	Total.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1879-80	6,87,162	2,38,070	9,25,232	2,38,744	11,63,976
1880-81	7,32,956	2,07,752	9,40,708	2,48,897	11,89,605
1881-82	8,86,044	2,12,897	10,98,941	2,74,070	13,73,011
1882-83	8,68,991	2,22,036	10,91,027	2,72,652	13,63,679
1883-84	8,78,816	2,14,128	10,92,944	2,74,762	13,67,706
1884-85	8,53,757	2,13,717	10,67,474	3,36,613	14,04,087
Average	8,17,954	2,18,100	10,36,054	2,74,290	13,10,344
1885-86	8,31,148	2,48,524	10,79,672	3,16,215	13,95,887
Difference	+13,194	+30,424	+43,618	+41,925	+85,543

The charges are all slightly above the average, but very nearly agree with those for the previous year. The total charges against revenue during the year were—

	Rs.	Rs.
Extensions and Improvements	1,28,984	
Maintenance and Repairs	8,31,148	
		9,60,132
Establishment, Public Works	2,82,781	
,, Revenue	3,16,215	
		5,98,996
Total ...		15,59,128

The total expenditure by the Public Works Department was Rs. 12,76,347, and this is slightly under the amount which has been lately given as that required annually to enable the canals and embankments to be maintained in an efficient state. This amount is—

	Rs.
Extensions and Improvements	1,20,000
Maintenance and Repairs	9,00,000
Establishment, Public Works Department	2,95,000
Total ...	13,15,000

8. The percentage of expenditure on revenue, leaving out the expenditure on extensions and improvements and taking merely the cost of maintenance and repairs and Public Works and Revenue establishment, and the cost of maintenance per acre for the year and the six previous years, were as below :—

TABLE H.

Years.	Cultivation.	Net Canal Revenue.	Maintenance and Repairs and Revenue Collection.	Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.
	Acres.	Rs.	Rs.		
1879-80	1,454,028	28,53,207	11,63,976	40·80	0·80
1880-81	1,492,669	29,44,032	11,89,605	40·41	0·79
1881-82	1,601,986	33,45,741	13,73,011	41·04	0·86
1882-83	1,673,293	33,38,844	13,63,679	40·84	0·82
1883-84	1,540,831	33,07,052	13,67,706	41·36	0·88
1884-85	1,783,173	37,73,166	14,04,087	37 21	0·79
Average	1,592,6[illegible]3	32,60,360	13,10,344	40·28	0·82
1885-86	1,739,919	35,77,341	13,95,887	39·02	0·80

The percentage of expenditure was below the average and the cost of maintenance per acre slightly over 12¾ annas per acre. The percentage of cost of Public Works establishment on the expenditure incurred on maintenance and repairs during the year was 29·90 as against 25·03 for the previous year.

9. There were some slight alterations made in the lengths of canals and embankments, owing to a few canals being taken over by Government, or struck off the list, and to new loop lines of embankment, but these are shown in Table V., and are not of sufficient importance to call for any special remarks.

10. The general abstract of financial results of the irrigation works in the Province for and up to the close of the year under report is attached, and the results there recorded are summed up in the table below for easy reference ;—

TABLE I.

Class of Works.	Gross Revenue.	Working Expenses.	Net Revenue.	Simple Interest.	Net Profit.
	Rs.	Rs.	Rs.	Rs.	Rs.
Major Works	6,73,096	2,18,952	4,54,144	2,95,653	1,58,491
Minor Works and Navigation for which Capital and Revenue Accounts are kept	8,00,469	4,81,187	3,19,282	...	3,19,282
Minor Works and Navigation for which only Revenue Accounts are kept ...	17,44,353	8,13,623	9,30,730	...	9,30,730
1885-86	32,17,918	15,13,762	17,04,156	2,95,653	14,08,503
1884-85	34,39,369	15,45,724	18,93,645	2,74,172	16,19,473
Difference	-2,21,451	-31,962	-1,89,489	+21,481	-2,10,970

The figures call for no special remark, as the decrease shown has been explained in a former paragraph.

11. The following table may be of interest as showing the general result of the expenditure which has been incurred on the canals in the Province during the past five years :—

TABLE J.

Class of Works.	Year.	Water Share of net Consolidated Revenue collected.	Hakába and Miscellaneous.	Total collected.	Expenditure against Revenue.	Percentage.
		Rs.	Rs.	Rs.	Rs.	
Major Works—Productive Works	1881-82	3,85,372	48,723	4,34,095	1,51,056	34·8
	1882-83	4,03,745	71,548	4,75,293	1,77,859	37·4
	1883-84	4,51,934	68,292	5,20,226	1,79,225	34·4
	1884-85	5,75,528	81,249	6,56,777	2,10,950	32·1
	1885-86	6,29,781	71,615	7,01,396	2,13,057	30·4
Minor Works and Navigation	1881-82	27,19,566	68,071	27,87,637	13,07,462	46·9
	1882-83	26,92,879	65,248	27,58,127	13,26,305	48·1
	1883-84	26,60,560	70,402	27,30,962	13,58,282	49·7
	1884-85	31,18,293	75,547	31,93,840	13,76,024	43·1
	1885-86	28,58,082	72,536	29,30,618	13,46,071	45·9
Whole of Sind	1881-82	31,04,938	1,16,794	32,21,732	14,58,518	45·3
	1882-83	30,96,624	1,36,796	32,33,420	15,04,164	46·5
	1883-84	31,12,494	1,38,694	32,51,188	15,37,507	47·3
	1884-85	36,93,821	1,56,796	38,50,617	15,86,974	41·2
	1885-86	34,87,863	1,44,151	36,32,014	15,59,128	42·9

It will be observed that the actual collections on account of the canals in the Upper Sind Frontier and the Eastern Nára, which are classed as Productive works, have steadily increased year by year from Rs. 4,34,095 to Rs. 7,01,396, while the percentage of expenditure against revenue has decreased from 34·8 to 30·4. On the other canals the actual collections have slightly increased, and the percentage of expenditure has slightly decreased. For the whole Province the percentage has decreased from 45·3 to 42·9.

FRONTIER UPPER SIND.

BEGÁRI CANALS.

12. The inundation, as far as the canals in the Frontier districts were concerned, was a very good one, the fall in the river in August only affecting the full supply in the canals for a few days and doing no harm. Water was admitted into the Desert Canal on the 25th May, and flowed until the 15th October; but notwithstanding the largeness and steadiness of the supply, the returns show a

falling off of 22,441 acres of cultivation and of Rs. 44,417 of revenue as compared with the previous year. The lands in Khelat have not been surveyed and the areas recorded as cultivated are in all probability very far from correct: but the area of cultivation on the canal has undoubtedly decreased, and the cause of this is that the land has been overcropped of late years and requires rest.

13. The Unharwah, a new canal with its head in the 12th mile of the Kashmor bund, was commenced in December 1884, and the excavation was completed on the 25th May 1885; the bridges and regulators were completed on the 4th of June, and the canal was opened on the 5th June. Owing to the canal being in rather heavy embankment in the first few miles, and the land not having been given out by the Revenue authorities owing to pressure of transport work, the full supply could not be admitted until rather late in the year: but it was maintained from the 29th July to the 15th September and the area under cultivation was 11,831 acres, giving a revenue of Rs. 23,937. The remissions on the canal were only Rs. 171. Since the canal was opened the embankments have been raised and strengthened, and for the future there will be no difficulty in admitting 7 or 7½ feet of water instead of the estimated depth of 6 feet.

14. The Begári Canal was opened on the 14th May, not so much for the purposes of irrigation, as to supply the Railway tanks at Jacobabad and Jhatpat. During the working season of 1884-85 several improvements and extensions were carried out, the principal ones being the widening of the mouth and the addition of two 12½ feet openings to the head regulator: the cutting off of two rather bad loops in the canal: and the extension of the Edenwah in British territory to irrigate new lands in Deh Sir Amani of the Shahdádpur Táluka. The effects of these improvements was to largely increase the supply of water in the lower reaches of the canal, and to produce according to the returns an increase of 9,527 acres of cultivation and of Rs. 52,049 of revenue over that of the previous year. The remissions on the canal during the year were Rs. 6,306. The area of cultivation in British territory was about 16,500 acres more than in the previous year, and this will account for the increase of over half a lákh of rupees in the revenue.

15. The Kashmor bund gave no trouble during the year, as it was in very good order and no leaks occurred at any part of it. But the river encroached seriously opposite the 40th mile, and as the encroachment continued during the inundation of 1886, it has become necessary to construct a loop bund. Table No. 7 shows an area of cultivation against the bund of 5,872 acres, and a revenue of Rs. 12,013, due to several small canals which have their head sluices in the bund, and irrigate certain small areas of land lying between the bund and the Sind Dhora.

16. The following table shows the total canal revenue collected on the canals in the Frontier districts, the cost of maintenance and revenue collection, the total charges against revenue, and the percentages of these for the year under report and the four previous years. The figures of expenditure include the cost of maintenance of the Kashmor bund:—

Year.	Total Canal Revenue collected.	Revenue Charges.		Percentage of maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1881-82	2,56,892	2,18,859	2,21,611	85·2	86·3
1882-83	3,34,103	1,64,166	2,60,790	49·1	78·1
1883-84	3,38,979	1,60,780	1,85,468	47·5	54·7
1884-85	4,42,476	1,69,984	1,69,984	38·4	38·4
1885-86	4,77,172	1,80,345	1,80,345	37·8	37·8

The result of the expenditure on the Kashmor bund and on the several canals cannot but be considered as satisfactory, as there has been a steady yearly increase in the canal revenue collected, and the percentage of expenditure has steadily decreased.

SHIKA'RPUR CANALS.

17. The canals in this district worked well throughout the inundation, and there were no accidents to any of the embankments. On the Sind Canal there was an increase of 8,540 acres of cultivation and Rs. 21,039 of revenue as compared with the previous year. On the canals and bunds in Rohri the acreage and revenue was about the same as in 1884-85. The financial results for 1885-86 and the four previous years are shown below :—

Year.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1881-82	2,28,238	1,24,246	1,38,964	54·4	60·9
1882-83	2,26,661	1,36,347	1,51,543	60·1	66·8
1883-84	2,14,442	1,10,790	1,61,008	51·2	75·1
1884-85	2,73,536	1,14,899	1,67,241	42·0	61·1
1885-86	2,88,336	1,44,433	1,78,861	50·1	62·0

The percentages are high, as the figures for expenditure include the cost of special and ordinary repairs to the Sukkur-Begári bund.

GHA'R CANALS.

18. The changes in the course of the Indus above and below Sukkur seriously affected the working of the canals in this district: north of Sukkur the set of the river, which has been for some years on to the right bank, began to shift, and its tendency now is to cut into its left bank immediately above Rohri. South of Sukkur the set has been for some years persistently on to the right bank, and the whole line of embankment, and the mouths of the Ghár, Fordwah and Nára, have been steadily encroached upon. The village of Madeji, which was formerly on the bank of the Ghár at the fifth mile, was partially washed away, and it became necessary to construct a new loop line behind the western end of the Jháli bund. The mouth of the Ghár, in consequence of this erosion, was blocked with silt, and the supply to all the branches north of Nowadera was seriously deficient. The Fordwah sluice was washed away by the river on the 31st July, and it became necessary to throw a bund across that channel; and the supply to all the branches of the Ghár at and below Lárkhána was cut off. The river also encroached at the mouth of the Nára and the supply in that channel was at one time slightly reduced, though it did not suffer to the same extent as the Ghár. The consequence of the erosion at the mouths of these canals was naturally a large decrease in revenue, heavy remissions, and serious loss to the cultivators.

19. The rabi supply in the Sukkur Canal from November to March was fairly good up to the first week in January, and the two freshets in January and February were of great assistance: but in places where zamíndárs trusted to a supply by flow, the irrigation was a partial failure, and the crops were very inferior. The general result was a decrease of 9,753 acres of rabi as compared with 1884-85. The canal was opened for kharíf on the 23rd May, but owing to the prevalence of cholera in many villages along its banks, this early supply was not turned to much use. A good supply was admitted in June, but in July the supply was insufficient for the transplantation of rice: and as in the beginning of August the supply at the Rahuja head was about one foot below the proper level, it became necessary to open the old head. This caused a heavy deposit of silt in the first mile of the canal, and considerably reduced the rabi supply of 1885-86. The result for the year was a decrease of 11,762 acres of cultivation, and of Rs. 27,538 of revenue. The remissions for the year were Rs. 3,325.

20. The Ghár was opened for kharíf on the 1st May, and it ceased to flow on the 1st October. The mouth of the main canal worked fairly well during

June and the first part of July. During the second rise at the end of August the mouth silted heavily owing to the continued erosion of the river which encroached steadily at the rate of 100 to 200 feet a day, and the supply in the first 27 miles of the canal was interfered with to a serious extent. At the end of July the Fordwah sluice was carried away, and all the canals below the 27th mile suffered. A new head regulator to this canal was built in the early part of 1886. The result was a decrease of 43,032 acres of cultivation and of Rs. 1,23,145 of consolidated revenue: the remissions moreover were Rs. 1,01,756 against Rs. 14,380 in 1884-85.

21. The supply in the Nára was fairly good throughout the season, though the erosion of the river at its mouth caused a good deal of silt deposit towards the end of the inundation, and prevented any discharge being available for rabi. The result was a decrease of 14,656 acres of cultivation, and of Rs. 34,267 of consolidated revenue. The remissions were only Rs. 7,012 against Rs. 9,923 in 1884-85. The supply in the Wahur and Marviwah was about the average, and no improvement can be anticipated until the river changes its course. The embankments on the right bank were maintained in tact.

22. The financial results for the canals in this district for the year under report and the four previous years are given below :—

Year.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1881-82	10,79,234	3,00,601	3,17,922	27·9	29·4
1882-83	11,40,155	3,26,984	3,47,914	28·7	30·5
1883-84	11,30,274	3,04,277	3,23,305	26·9	28·6
1884-85	13,19,002	3,05,683	3,62,399	23·2	27·5
1885-86	10,37,602	3,06,686	3,63,637	29·6	35·0

It will be observed that the total canal revenue collected was the minimum of the five years, and was Rs. 2,82,400 less than in 1884-85 : the percentages are consequently maxima. Future reports may be anticipated thus far that there was but little improvement during the inundation of 1886, the river having further encroached for over a mile at the Ghár mouth: but that the river will certainly leave its right bank and take to a new cut off which was partially formed during the past inundation: and that it has left the Fordwah mouth and the mouth of the Nára in most favourable positions. The inundation of 1887 will in all probability give the full revenue on all the canals.

THAR AND PA'RKAR.

Eastern Nára Canals.

23. During the cold weather of 1884-85 the Nára supply channel at Rohri, on which the Eastern Nára system of canals depends for its supply, was deepened, and the sill of its head regulator was lowered. This work, owing to an experiment being tried with a new system of needles, was not completed until very late in the season, and the consequence was a considerable reduction in the kharíf revenue and rather large remissions. This was partially compensated by an increased area of rabi: but the result on the whole was not satisfactory, as had the experiment not been tried, there would have been a very large increase of both kharíf and rabi revenue. The result for the whole system of canals was a decrease in kharíf of 14,635 acres, an increase in rabi of 25,748 acres, and an increase in consolidated revenue of Rs. 19,400: the remissions however were Rs. 4,413 against Rs. 267 in 1884-85. The Mithrau Canal was opened on the 26th June, about six weeks later than the proper time, and on this canal there was a decrease of 10,162 acres of kharíf, an increase of

15,362 acres of rabi, and an increase of consolidated revenue of Rs. 16,705, the remissions being Rs. 1,230 against Rs. 41 in 1884-85. Water did not reach the Thar Canal until the beginning of August, which is too late a date for the commencement of kharíf operations, and there was consequently a decrease in the kharíf area of 7,067 acres: the increase in the rabi area was 9,173 acres: the increase of consolidated revenue was Rs. 582; but the remissions were Rs. 3,183 against Rs. 201 in 1884-85, giving a net loss of revenue of Rs. 2,400. There was a very slight increase of revenue on the Dimwah and Heranwah: and the revenue of the Nára lands proper was about the same as in the previous year.

24. The financial results for the year under report and for the four previous years are shown below :—

Year.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1881-82	1,77,322	68,364	68,497	38·5	38·6
1882-83	1,42,656	69,503	69,503	48·8	48·8
1883-84	1,85,473	76,761	76,761	41·4	41·4
1884-85	2,21,625	86,216	86,216	38·9	38·9
1885-86	2,35,204	87,327	87,327	37·1	37·1

It will be noticed that there has been a steady increase of canal revenue for the past four years and a reduction in the percentages; and this improvement may be expected to continue as the deepening of the supply channel will enable a full supply for the rabi to be let into all the canals.

HYDERABAD COLLECTORATE.

Hyderabad Canals.

25. There is no great room for improvement in the canals in this district as the land is high and there is very little flow irrigation, and moreover the cultivating population is limited in number. An improvement in one of the canals, and an increased supply of water, gives an increase of revenue on that particular canal; but this is almost certain to be followed by a falling off on the other canals adjacent to it, the cultivators naturally going to the canal which has the best supply of water, and from which they can irrigate at least cost to themselves. The returns show an increase of 2,837 acres of cultivation and a decrease of Rs. 73,821 of consolidated revenue. The revenue of 1884-85 however included the revenue charged on fallow lands which was afterwards deducted in the shape of remissions, and this amounted to Rs. 60,391. The remissions in 1885-86 were only Rs. 2,757. The financial results for the years 1881-82—1885-86 are shown below :—

Year.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1881-82	6,25,023	2,43,266	2,48,998	38·9	39·8
1882-83	6,02,542	2,41,048	2,42,001	40·1	40·3
1883-84	5,37,269	2,45,808	2,45,808	45·7	45·7
1884-85	6,35,855	2,37,841	2,51,853	37·4	39·6
1885-86	6,18,608	2,08,670	2,11,177	33·7	34·1

It will be noticed that the canal revenue has remained pretty steady for the past five years, and that, omitting the year 1883-84, there has been but little variation in the percentages. The canals are in very fair order, but the most that can be hoped for is that the grant for clearances will suffice to keep the revenue up to its present amount.

Fuleli Canals.

26. The inundation was a favourable one for the canals in this district. The water-supply was good throughout the season, and complaints of deficiency of water were few. The returns show an increase in the area of cultivation of 8,281 acres and an increase in consolidated revenue of Rs. 18,541: the remissions were Rs. 1,413 against Rs. 3,246 in 1884-85. The financial results of the canals for 1885-86 and four previous years are shown below:—

Year.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1881-82	3,76,723	1,73,704	1,73,704	46·1	46·1
1882-83	3,48,745	1,85,435	1,85,675	53·2	53·2
1883-84	3,69,263	1,81,258	1,81,386	49·0	49·0
1884-85	4,17,606	2,32,754	2,32,754	55·7	55·7
1885-86	4,33,198	2,08,654	2,08,654	48·2	48·2

There has been a steady increase of revenue for the past four years, and this increase may be expected to continue as the temporary settlements are introduced in the southern tálukas of the district.

KARA'CHI COLLECTORATE.

Karáchi Canals.

27. The inundation as a whole was a good one for the canals in this district, and compares favourably with any of the past 20 years. The returns show a slight increase in the area of cultivation of 355 acres and a decrease in consolidated revenue of Rs. 1,265: the remissions for the year were Rs. 24,891 or Rs. 8,077 more than in the previous year. The decrease in the revenue is altogether on account of the rabi, and the smallness of the increase of area was due to jághír land. There was an increased area of kharíf of 1,944 acres with an increased revenue of Rs. 9,916: an increased area of 651 acres of rabi with a decrease in revenue of Rs. 11,384, and a decrease of 2,240 acres of jághír cultivation with an increase in revenue of Rs. 203. The principal cause of the decrease in the rabi revenue was the failure of the supply in the Western Nára during the cold weather owing to the erosion of the river at its mouth at the end of the inundation, as the returns show a decrease of rabi cultivation on that canal of 3,978 acres, and a decrease in revenue of Rs. 15,718. The financial results for 1885-86 and four previous years are shown below:—

Year.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1881-82	4,78,300	2,43,971	2,88,822	51·0	60·4
1882-83	4,38,558	2,40,196	4,46,738	54·8	56·3
1883-84	4,75,488	2,88,032	3,63,771	60·5	76·5
1884-85	5,40,517	2,56,710	3,16,527	47·5	58·6
1885-86	5,41,894	2,59,772	3,29,127	47·9	60·7

The revenue has increased during the past four years and the percentages remain steady.

28. The expenditure on river embankments has of late years been heavy, not only on account of direct erosion of the river, but also on account of the high water level having steadily risen. The systematic construction of embankments in the upper portions of the river has probably been the cause of the rise of high water level in the delta reaches south of Jerruck: but whatever the cause has been, the crest of the embankments is now only measured by inches above the high flood level, and in order to render them safe it will be necessary to raise them all at least 3 feet. The cost of this will be rather heavy, but the work will have to be done sooner or later, and the sooner it can be done the better for the district. In addition to this, a system of drainage works in the Sháhbandar districts is urgently required, as at present there is no means of getting rid of the surplus water, and this work will have to be carried out as soon as money is available.

J. LEMESURIER, Colonel, R. E.,

Superintending Engineer for Irrigation in Sind.

Karáchi, 11th December 1886.

No. 2603 of 1886.

Public Works Department.

From

The SUPERINTENDING ENGINEER for IRRIGATION in SIND;

To

The JOINT SECRETARY to GOVERNMENT,
Public Works Department (Irrigation), Bombay.

Superintending Engineer's Office,
Karáchi, 14th December 1886.

Sir,

I have the honour to forward my Annual Irrigation Revenue Report for 1885-86, accompanied by the usual tables and general revenue accounts. The latter were received by me from the Examiner, Public Works Accounts, on the 25th ultimo, and Statements I B., I C., II C., III C., and IV C. on the 30th idem.

I have the honour to be,
Sir,
Your most obedient Servant,
J. LeMESURIER, Colonel, R. E.,
Superintending Engineer for Irrigation in Sind.

No. 4928 of 1886.

Public Works Department.

Commissioner's Office,
Camp Jacobabad, 20th December 1886.

In forwarding this report to Government there is not much that calls for remark by the Commissioner. The facts are so clearly and concisely stated that detailed review would serve no useful purpose.

2. The inundation of 1885 was a favourable one, an "exceptionally good one" the Superintending Engineer for Irrigation terms it, but in spite of this the area under canal cultivation and share of Government revenue due to irrigation is less than in the year 1884-85. The principal cause for this decrease was the unfortunate failure of supply in the Ghár, one of the most important canals in the Province, a failure due partly to erosion by the river Indus at the mouth of the canal and partly also to the delay in selecting a site for the new regulating bridge on the Fordwah, a feeder of the Ghár, and in the erection of the regulator to control the supply. This delay undoubtedly resulted in a large loss of revenue and loss also to the cultivators. The falling off in the revenue from this cause was certainly over two lákhs of rupees, for the actual loss to Government exceeded the amount of revenue remitted as owing to the state of the canal a good deal of land along a part of its course was left uncultivated, which, had the supply been better, would have been brought under the plough. But for this loss the revenue of the year would have shown a satisfactory increase.

3. With regard to the water-rate levied on cultivation in Baluchistán it appears from the table in para. 4 that the collections are still very irregular. The water-rate on Khelat lands for the year amounted to Rs. 60,155 while the actual realizations were Rs. 48,000. Steps are, it is stated, being taken by the

Khelat authorities to levy the outstanding balances. With regard to the hakába or clearance rate levied on cultivation in jághír lands there is nothing in the figures given that calls for remark.

4. It is unnecessary for the Commissioner to follow Colonel LeMesurier who gives details for the different groups of canals and districts, but he would draw attention to that officer's remarks in para. 28 in connection with the protective embankments in Lower Sind. The urgent need of improving these has more than once been brought to the notice of Government, and it is to be hoped that money may be granted for the purpose at an early date as it is hardly too much to say that the prosperity of the agricultural classes in Lower Sind depends on this work being carried out.

5. The results for the year reported on are on the whole very satisfactory. Fluctuations in revenue there ever must be in dealing with canals fed by the Indus, which, as explained in Colonel LeMesurier's 18th para., has, by the variations in its course, seriously affected the working of several of the canals, but there can be no question that if sufficient grants are given to enable the officers of the Irrigation Department to maintain the canals in good working order, the increased area brought under cultivation during the past few years will not only be maintained but a still very marked further increase both in area under cultivation and in revenue may confidently be expected.

6. It is with regret that the Commissioner has learnt that there is a probability that Sind may very shortly be deprived of the services of Colonel J. LeMesurier, the Superintending Engineer for Irrigation. Such an event will be a serious loss to the Province, as by his intimate acquaintance with the canals and their requirements Colonel LeMesurier has been able to do much to improve the efficiency of the Department he has so long and ably controlled.

H. N. B. ERSKINE,
Commissioner in Sind.

TABLE I.

Cultivation and Water-share of Net Consolidated Revenue for 1885-86 and three previous years.

Canals and District.	1882-83.		1883-84.		1884-85.		Average.		1885-86.	
	Acres.	Revenue.	Acres.	Revenue.	Acres.	Revenue.	Acres.	Revenue.	Acres.	Revenue.
		Rs.		Rs.		Rs.		Rs.		Rs.
Begári Canals — Desert Canal	71,869	1,18,901	55,490	96,341	74,409	1,29,157	67,256	1,14,800	53,125	93,469
Begári Canals — Unharwah	....	....	....	....	....	....	....	....	11,831	21,389
Begári Canals — Begári Canal	108,532	1,87,935	105,3 2	1,95,030	132,215	2,40,514	113,683	2,07,843	148,787	2,84,554
Begári Canals — Kashmor Bund	645	1,144	2,.22	3,804	3,984	7,158	2,250	4,035	5,872	10,812
Shikárpur Canals — Canal in Rohri	51,348	1,08,472	43,691	1,02,392	68,235	1,38,844	54,425	1,16,569	60,554	1,38,879
Shikárpur Canals — Bunds in Rohri	3,.21	7,224	2,305	5,209	3,977	7,490	3,368	6,641	3,749	8,334
Shikárpur Canals — Sind Canal	49,957	1,15,266	41,184	1,01,464	46,221	1,18,644	45,787	1,11,791	49,642	1,33,824
Shikárpur Canals — Sukkur-Begári Bund	....	....	....	.. ..	....	....	.. .	....	....	....
Ghár Canals — Sukkar Canal	73,283	1,53,981	50,630	1,38,145	71,057	1,63,182	67,990	1,51,769	57,654	1,37,501
Ghár Canals — Ghar	230,265	6,52,215	194,785	6,39,430	212,574	6,71,131	212,541	6,54,259	168,912	4,81,083
Ghár Canals — Nára	122,809	3,38,273	98,518	3,06,992	131,892	3,96,248	117,740	3,47,171	118,485	3,69,262
Ghár Canals — Wáhur	9,077	22,337	7,100	15,423	8,706	20,946	8,514	19,569	7,001	17,140
Ghár Canals — Marvi	3,628	10,237	3,446	9,051	3,744	10,005	3,630	9,764	3,709	9,892
Ghár Canals — Bunds, right bank	12	41	23	95	80	156	41	97	46	80
Eastern Nára Canals — Nára Supply Channel	62	138	398	1,027	742	2,005	401	1,056	2,139	5,525
Eastern Nára Canals — Eastern Nára	7,866	10,630	9,655	16,205	10,098	20,555	9,206	15,797	12,168	18,281
Eastern Nára Canals — Mithrau Canal	56,993	92,426	64,969	1,14,513	73,492	1,32,484	65,018	1,13,141	78,292	1,46,411
Eastern Nára Canals — Thar Canal	9,150	16,110	16,059	29,691	23,176	44,451	16,128	30,084	25,282	42,201
Eastern Nára Canals — Dimwah	1,130	2,151	1,276	1,901	1,796	2,844	1,401	2,299	2,165	3,780
Eastern Nára Canals — Heranwah	136	249	225	323	586	818	316	403	557	902
Hyderabad Canals — Mehrabwah	11,644	18,765	9,631	19,052	10,092	19,684	10,455	19,167	12,743	23,746
Hyderabad Canals — Nasrat	22,651	44,929	11,046	29,003	16,476	39,933	16,658	37,955	16,103	38,806
Hyderabad Canals — Naolakhi	40,171	94,377	38,452	8.,028	45,604	1,03,393	41,408	95,266	45,674	1,00,899
Hyderabad Canals — Dambro	5,627	13,679	5,303	12,392	5,.96	11,652	5,365	12,575	5,968	12,884
Hyderabad Canals — Dad	19,245	40,768	17,147	37,023	17,233	36,694	17,875	38,162	17,874	36,974
Hyderabad Canals — Rein	10,339	21,003	9,871	21,941	13,516	26,774	11,242	23,439	17,444	33,246
Hyderabad Canals — Alibhar Kacheri	7,335	15,264	7,085	14,164	8,090	16,831	7,670	15,420	6,652	13,692
Hyderabad Canals — Márak	41,084	91,514	39,154	86,269	41,226	88,480	40,488	88,754	36,958	81,472
Hyderabad Canals — Gharo Mahmuda	41,681	79,947	42,302	77,704	52,408	98,437	45,464	85,303	49,318	91,948
Hyderabad Canals — Kari Shumall	27,942	38,687	28,298	37,581	28,306	40,100	28,182	38,923	25,753	33,203
Hyderabad Canals — Nasir	25,021	40,347	23,041	40,604	25,269	48,419	24,444	43,123	24,226	42,843
Hyderabad Canals — Sarfraz	17,704	24,824	16,698	25,095	19,516	28,187	17,973	26,035	18,625	26,422
Hyderabad Canals — Other Canals	21,206	48,832	17,689	41,642	20,936	45,772	19,944	45,415	23,601	52,168
Fuleli Canals — Fuleli	155,281	3,12,260	162,313	3,55,060	170,477	3,40,844	162,690	3,36,065	172,055	3,57,111
Fuleli Canals — Other Canals	16,821	31,803	16,664	44,909	12,695	31,955	15,394	36,222	14,347	35,374
Karáchi Canals — Nára	72,353	1,48,245	64,190	1,45,333	73,187	1,64,445	69,910	1,52,674	71,165	1,53,830
Karáchi Canals — Phitta	5,912	13,730	4,746	9,048	5,424	10,562	5,361	11,113	4,950	9,248
Karáchi Canals — Canals north of Kotri	13,877	28,903	10,550	20,521	12,597	24,464	12,341	24,629	11,877	22,572
Karáchi Canals — Kairi	9,728	19,054	5,827	13,790	6,036	15,713	7,197	16,186	7,019	17,497
Karáchi Canals — Baghár	15,971	30,516	11,908	21,199	12,821	25,268	13,567	25,631	14,671	28,630
Karáchi Canals — Uchita	12,315	29,643	9,573	21,372	8,894	18,825	10,231	23,280	10,441	24,308
Karáchi Canals — Canals in Tatta, &c.	8,234	12,515	5,724	11,406	7,471	15,300	7,143	13,241	8,945	17,011
Karáchi Canals — Shal Canals	....	....	1,023	1,639	2,115	5,542	1,046	2,394	3,377	3,113
Karáchi Canals — Pinyári	54,268	77,812	51,331	1,21,790	56,093	1,41,952	53,897	1,13,851	56,426	1,39,505
Karáchi Canals — Canals in Mirpur Batoro	9,694	15,651	9,485	23,007	9,193	23,849	9,457	20,836	9,763	22,742
Karáchi Canals — Canals in Sujáwal	10,738	8,808	6,648	15,503	7,135	17,006	8,174	13,772	6,721	15,490
Karáchi Canals — Satta	8,425	16,621	6,638	17,205	7,171	17,663	7,411	17,183	6,518	17,391
Karáchi Canals — Canals in Jati	1,725	3,222	1,202	4,046	1,774	4,306	1,567	3,848	1,217	3,456
Karáchi Canals — Khanta	6,393	9,761	5,957	8,621	5,207	9,602	5,852	9,328	5,092	8,932
Karáchi Canals — Kokawari	15,138	26,120	14,145	21,152	15,012	31,587	14,765	26,287	13,905	28,472
Karáchi Canals — Canals in Shahbandar	2,471	4,482	1,870	3,481	2,383	4,622	2,235	4,195	2,452	4,197
Karáchi Canals — Bunds, left bank	458	1,445	418	1,352	413	1,287	430	1,361	627	2,050
Karáchi Canals — Bunds, right bank	87	132	....	....	....	.. ..	29	44	245	549
Begári Canals	176,046	3,08,030	162,914	2,95,175	210,608	3,76,829	183,189	3,26,678	219,615	4,10,224
Shikárpur Canals	105,126	2,30,902	87,180	2,09,065	118,433	2,64,978	103,580	2,35,001	113,945	2,81,037
Ghár Canals	439,744	11,77,084	363,502	11,09,136	428,122	12,61,668	410,456	11,82,629	355,807	10,14,958
Eastern Nára Canals	75,337	1,21,704	92,582	1,63,660	109,490	2,03,157	92,470	1,62,840	120,603	2,17,190
Hyderabad Canals	292,150	5,73,536	265,717	5,30,893	303,638	6,04,356	287,169	5,69,597	300,939	5,93,303
Fuleli Canals	172,102	3,44,072	178,977	3,99,989	183,172	3,72,799	178,084	3,72,287	186,402	3,92,485
Karáchi Canals	247,787	4,46,660	211,235	4,00,435	232,816	5,32,583	230,613	4,79,893	235,411	5,23,993
Total	1,508,292	32,02,048	1,362,107	31,68,358	1,586,279	36,16,370	1,485,560	33,28,925	1,532,722	34,33,190

TABLE II.

Area of Cultivation and Canal Revenue for 1885-86 and five previous years.

Years.	Cultivation.			Water share of net Consolidated Revenue.	Hakába.	Miscellaneous.	Total Canal Revenue.
	Government.	Jághír.	Total.				
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1880-81	1,328,662	164,007	1,492,669	28,43,067	41,722	59,243	29,44,032
1881-82	1,418,929	183,057	1,601,986	32,28,947	74,828	41,966	33,45,741
1882-83	1,508,292	165,001	1,673,293	32,02,048	87,057	49,739	33,38,844
1883-84	1,362,107	178,724	1,540,831	31,68,358	85,134	53,560	33,07,052
1884-85	1,586,279	196,894	1,783,173	36,16,370	1,06,090	50,706	37,73,166
Average	1,440,854	177,537	1,618,391	32,11,758	78,966	51,043	33,41,767
1885-86	1,532,722	207,197	1,739,919	34,33,190	96,037	48,114	35,77,341
Increase or Decrease	+91,868	+29,660	+121,528	+2,21,432	+17,071	-2,929	+2,35,574

J. LeMESURIER, Colonel, R. E.,
Superintending Engineer for Irrigation in Sind.

TABLE III.

Area of Cultivation and Revenue for 1885-86.

Canals, Executive Districts, and Collectorates.			Cultivation.			Water share of net Consolidated Revenue as in Table VII.	Hakába.	Miscellaneous	Total Canal Revenue.
			Government.	Jághir.	Total.				
			Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Frontier Upper Sind.	Begári Canals.	Desert Canal	53,125	31,920	85,045	93,469	21,414	168	1,15,051
		Unharwah	11,831	...	11,831	21,389	...	...	21,389
		Begári Canal	148,787	34,566	183,353	2,84,554	30,791	523	3,15,868
		Works for which no Capital or Revenue Accounts are kept... ...	5,872	...	5,872	10,812	...	168	10,980
Shikárpur Collectorate.	Shikárpur Canals.	Canals in Rohri	60,554	5,379	65,933	1,38,879	1,745	1,170	1,41,794
		Bunds in Rohri	3,749	...	3,749	8,334	...	...	8,334
		Sind Canal	49,642	6,835	56,477	1,33,824	4,646	293	1,38,763
		Sukkur-Begári Bund	...	...	...	...	...	126	126
		Works for which no Capital Accounts are kept	...	..	...	...	...	12	12
	Ghár Canals ...	Sukkur Canal	57,654	2,234	59,888	1,37,501	1,055	633	1,39,189
		Ghár do.	168,912	6,591	175,503	4,81,083	2,575	4,442	4,88,100
		Nára do.	118,485	8,281	126,766	3,69,262	2,906	4,441	3,76,609
		Wáhur do.	7,001	...	7,001	17,140	...	674	17,814
		Marvi do.	3,709	...	3,709	9,892	...	971	10,863
		Bunds, right bank	46	59	105	80	29	21	130
		Works for which no Capital Accounts are kept	...	...	...	...	...	20	20
Thar and Párkar.	Eastern Nára Canals ...	Nára Supply Channel	2,139	603	2,742	5,525	88	4,105	9,718
		Eastern Nára	12,168	...	12,168	18,281	...	13,307	31,588
		Mithrau Canal	78,292	...	78,292	1,46,411	...	797	1,47,208
		Thar Canal	25,282	569	25,851	42,291	273	143	42,707
		Dimwah	2,165	...	2,165	3,750	...	6	3,786
		Heranwah	557	...	557	902	...	..	902
		Works for which no Capital Accounts are kept	...	..	...	...	...	4	4
Hyderabad Collectorate.	Hyderabad Canals.	Mehrabwah	12,743	25	12,768	23,746	...	164	23,910
		Nasrat	16,103	614	16,717	38,806	264	190	39,260
		Naolakhi	45,674	2,510	48,184	1,00,899	771	173	1,01,843
		Dámbre	5,968	284	6,252	12,884	60	1	12,945
		Dad	17,874	4,658	22,532	36,974	1,353	195	38,522
		Rein	17,444	123	17,567	33,246	29	188	33,463
		Alibhar Kacheri	6,652	1,383	8,035	13,692	95	44	13,831
		Márak	36,958	6,005	42,963	81,472	1,703	124	83,299
		Gáro Mahmuda	49,318	12,688	62,006	91,948	2,638	626	95,212
		Kari Shumáli	25,753	10,271	36,024	38,203	1,647	402	40,252
		Nasir	24,226	1,725	25,951	42,843	354	160	43,357
		Sarfraz	18,625	4,802	23,427	26,422	583	390	27,395
		Other Canals	23,601	2,180	25,781	52,168	422	397	52,987
		Works for which on Capital Accounts are kept	...	...	...	...	...	4	4
	Fuleli Canals ...	Fuleli	•172,055	46,431	218,486	3,57,111	15,714	3,532	3,76,357
		Other Canals	14,347	697	15,044	35,374	355	160	35,889
		Works for which no Capital Accounts are kept.	...	...	...	...	...	...	...
Karáchi Collectorate.	Karáchi Canals.	Nára	71,165	6,106	77,271	1,53,830	1,409	5,170	1,60,409
		Phitta	4,950	974	5,924	9,248	229	327	9,804
		Canals north of Kotri	11,877	2,244	14,121	22,572	322	153	23,047
		Kalri	7,019	372	7,391	17,497	172	108	17,777
		Baghár	14,671	1,452	16,123	28,630	427	26	29,083
		Uchita	10,441	...	10,441	24,308	...	86	24,394
		Canals in Tatta, &c....	8,945	822	9,767	17,011	381	1,333	18,725
		Shal Canals	3,377	...	3,377	8,113	..	...	8,113
		Pinyári	56,426	1,896	58,322	1,39,505	945	1,685	1,42,135
		Canals in Mirpur Batoro	9,763	...	9,763	22,742	...	...	22,742
		Canals in Sujáwal	6,721	29	6,750	15,490	13	2	15,505
		Satta	6,518	295	6,813	17,391	129	10	17,530
		Other Canals in Jati	1,217	157	1,374	3,456	60	...	3,516
		Khanta	5,092	276	5,368	8,932	71	...	9,003
		Kokawari	13,905	...	13,905	28,472	...	320	28,792
		Canals in Shahbandar	2,452	243	2,695	4,197	55	51	4,303
		Bunds, left bank	627	464	1,091	2,050	118	...	2,168
		Bunds, right bank	245	434	679	549	196	...	745
		Works for which no Capital Accounts are kept	...	...	...	...	...	69	69
Begári Canals			219,615	66,486	286,101	4,10,224	53,205	859	4,63,288
Shikarpur Canals			113,945	12,214	126,159	2,81,037	6,391	1,601	2,89,029
Ghár Canals			355,807	17,165	372,972	10,14,958	6,565	11,202	10,32,725
Eastern Nára Canals			120,603	1,172	121,775	2,17,190	361	18,362	2,35,913
Hyderabad Canals			300,939	47,268	348,207	5,93,303	9,919	3,058	6,06,280
Fuleli Canals			186,402	47,128	233,530	3,92,485	16,069	3,692	4,12,246
Karáchi Canals...			235,411	15,764	251,175	5,23,993	4,527	9,340	5,37,860
		Total ...	1,532,722	207,197	1,739,919	34,33,190	96,037	48,114	35,77,341

J. LEMESURIER, Colonel, R. E.,
Superintending Engineer for Irrigation in Sind.

TABLE IV.

Revenue Expenditure on new Works, Maintenance and Repairs and Revenue Collection Charges in the Civil Department for 1885-86.

Canals and Districts.	Revenue Expenditure.								Total Revenue Expenditure.			
	Extensions and Improvements.			Maintenance and Repairs.			Revenue Collection Charges in the Civil Department.	Total.	Works.	Establishment.		Total.
	Works.	Establishment and Tools and Plant.	Total.	Works.	Establishment and Tools and Plant.	Total.				Public Works Department.	Civil Department.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals. — Desert Canal	...	...	...	20,607	7,870	28,477	10,451	38,928	20,607	7,870	10,451	38,928
Begári Canals. — Unharwah	...	...	...	5,808	1,746	7,554	2,087	9,641	5,808	1,746	2,087	9,641
Begári Canals. — Begári Canal	...	...	...	37,898	12,515	50,413	26,728	77,141	37,898	12,515	26,728	77,141
Begári Canals. — Káshmor Bund	...	...	...	43,614	9,940	53,554	1,081	54,635	43,614	9,940	1,081	54,635
Shikárpur Canals. — Canals in Rohri	2,001	430	2,431	44,642	9,582	54,224	13,852	68,076	46,643	10,012	13,852	70,507
Shikárpur Canals. — Bunds in Rohri	888	191	1,079	3,302	709	4,011	833	4,844	4,190	900	833	5,923
Shikárpur Canals. — Sind Canal	22,202	4,766	26,968	14,876	3,193	18,069	14,007	32,076	37,078	7,959	14,007	59,044
Shikárpur Canals. — Sukkur-Begári Bund	3,252	698	3,950	32,468	6,969	39,437	...	39,437	35,720	7,667	...	43,387
Ghár Canals. — Sukkur Canal	65	12	77	26,993	6,532	33,525	7,038	40,563	27,058	6,544	7,038	40,640
Ghár Canals. — Ghár Canal	33,387	7,550	40,937	95,976	21,787	1,17,763	36,903	1,54,666	1,29,363	29,337	36,903	1,95,603
Ghár Canals. — Nára	...	...	...	42,829	9,675	52,504	37,712	90,216	42,829	9,675	37,712	90,216
Ghár Canals. — Wáhur	...	...	...	1,210	273	1,483	1,780	3,263	1,210	273	1,780	3,263
Ghár Canals. — Marvi	...	...	...	1,042	235	1,277	1,086	2,363	1,042	235	1,086	2,363
Ghár Canals. — Bunds, right bank	13,000	2,937	15,937	12,729	2,875	15,604	11	15,615	25,729	5,812	11	31,552
Eastern Nára Canals. — Nára Supply Channel	...	...	...	3,871	827	4,698	561	5,259	3,871	827	561	5,259
Eastern Nára Canals. — Eastern Nára	...	...	...	7,815	2,264	10,079	2,791	12,870	7,815	2,264	2,791	12,870
Eastern Nára Canals. — Mithrau	...	...	...	19,739	11,237	30,976	14,609	45,585	19,739	11,237	14,609	45,585
Eastern Nára Canals. — Thar Canal	...	...	...	11,438	6,474	17,912	4,218	22,130	11,438	6,474	4,218	22,130
Eastern Nára Canals. — Dimwah	...	...	...	787	228	1,015	378	1,393	787	228	378	1,393
Eastern Nára Canals. — Heranwah	...	...	...	...	...	...	90	90	...	...	90	90
Hyderabad Canals. — Mehrabwah	...	...	...	5,473	1,502	6,975	2,377	9,352	5,473	1,502	2,377	9,352
Hyderabad Canals. — Nasrat	...	...	...	7,395	2,342	9,737	3,934	13,671	7,395	2,342	3,934	13,671
Hyderabad Canals. — Naolakhi	...	...	...	12,057	3,817	15,874	10,209	26,083	12,057	3,817	10,209	26,083
Hyderabad Canals. — Dámbro	...	...	...	5,848	1,852	7,700	1,297	8,997	5,848	1,852	1,297	8,997
Hyderabad Canals. — Dad	...	...	...	8,343	2,642	10,985	3,880	14,865	8,343	2,642	3,880	14,865
Hyderabad Canals. — Rein	...	...	...	8,120	2,571	10,691	3,362	14,053	8,120	2,571	3,362	14,053
Hyderabad Canals. — Alibhar Kacheri	...	...	...	5,565	1,527	7,092	632	7,724	5,565	1,527	632	7,724
Hyderabad Canals. — Márak	...	...	...	8,854	2,335	11,189	4,961	16,150	8,854	2,335	4,961	16,150
Hyderabad Canals. — Gháro Mahmuda	...	...	...	17,190	5,443	22,633	9,916	32,549	17,190	5,443	9,916	32,549
Hyderabad Canals. — Kari Shumali	...	...	...	9,141	2,894	12,035	3,999	16,034	9,141	2,894	3,999	16,034
Hyderabad Canals. — Nasir	1,904	603	2,507	11,273	3,569	14,842	4,453	19,295	13,177	4,172	4,453	21,802
Hyderabad Canals. — Sarfraz	...	...	...	7,525	2,064	9,589	1,588	11,177	7,525	2,064	1,588	11,177
Hyderabad Canals. — Other Canals	...	...	...	10,159	3,217	13,376	5,344	18,720	10,159	3,217	5,344	18,720
Fuleli Canals. — Fuleli	...	...	...	1,20,508	43,226	1,63,734	25,867	1,89,601	1,20,508	43,226	25,867	1,89,601
Fuleli Canals. — Other Canals	...	...	...	11,013	3,985	14,998	4,055	19,053	11,013	3,985	4,055	19,053
Karáchi Canals. — Nára	11,726	3,829	15,555	15,974	5,214	21,188	16,168	37,356	27,700	9,043	16,168	52,911
Karáchi Canals. — Phitta	...	...	...	4,925	1,607	6,532	1,040	7,572	4,925	1,607	1,040	7,572
Karáchi Canals. — Canals north of Kotri	...	...	...	10,191	3,328	13,519	2,144	15,663	10,191	3,328	2,144	15,663
Karáchi Canals. — Kalri	...	...	...	8,739	2,853	11,592	1,825	13,417	8,739	2,853	1,825	13,417
Karáchi Canals. — Baghár	...	...	...	7,820	2,552	10,372	2,900	13,272	7,820	2,552	2,900	13,272
Karáchi Canals. — Uchita	...	...	...	286	93	379	2,083	2,462	286	93	2,083	2,462
Karáchi Canals. — Canals in Tatta, &c.	...	...	...	4,897	1,599	6,496	1,914	8,410	4,897	1,599	1,914	8,410
Karáchi Canals. — Shal Canals	...	...	...	5,437	1,775	7,212	824	8,036	5,437	1,775	824	8,036
Karáchi Canals. — Pinyári	272	89	361	38,663	12,620	51,283	14,554	65,837	38,935	12,709	14,554	66,198
Karáchi Canals. — Canals in Mirpur Batoro	...	...	...	7,318	2,389	9,707	2,560	12,267	7,318	2,389	2,560	12,267
Karáchi Canals. — Canals in Sujáwal	...	...	...	3,187	1,040	4,227	1,535	5,762	3,187	1,040	1,535	5,762
Karáchi Canals. — Satta	...	...	...	5,507	1,798	7,305	1,743	9,048	5,507	1,798	1,743	9,048
Karáchi Canals. — Canals in Jati	...	...	...	1,951	635	2,586	352	2,938	1,951	635	352	2,938
Karáchi Canals. — Khanta	...	...	...	6,390	2,086	8,476	979	9,455	6,390	2,086	979	9,455
Karáchi Canals. — Kokawari	...	...	...	3,971	1,296	5,267	2,756	8,023	3,971	1,296	2,756	8,023
Karáchi Canals. — Canals in Shábbandar	...	...	...	2,731	891	3,622	460	4,082	2,731	891	460	4,082
Karáchi Canals. — Bunds, left bank	7,480	2,442	9,922	16,755	5,468	22,223	74	22,297	24,235	7,910	74	32,219
Karáchi Canals. — Bunds, right bank	32,807	10,710	43,517	10,298	3,363	13,661	214	13,875	43,105	14,073	214	57,392
Begári Canals	...	...	...	1,07,927	32,071	1,39,998	40,347	1,80,345	1,07,927	32,071	40,347	1,80,345
Shikárpur Canals	28,343	6,085	34,428	95,288	20,453	1,15,741	28,692	1,44,433	1,23,631	26,538	28,692	1,78,861
Ghár Canals	46,452	10,499	56,951	1,80,779	41,377	2,22,156	84,530	3,06,686	2,27,231	51,876	84,530	3,63,637
Eastern Nára Canals	...	...	...	43,650	21,030	64,680	22,647	87,327	43,650	21,030	22,647	87,327
Hyderabad Canals	1,904	603	2,507	1,16,943	35,775	1,52,718	55,952	2,08,670	1,18,847	36,378	55,952	2,11,177
Fuleli Canals	...	...	...	1,31,521	47,211	1,78,732	29,922	2,08,654	1,31,521	47,211	29,922	2,08,654
Karáchi Canals	52,285	17,070	69,355	1,55,040	50,607	2,05,647	54,125	2,59,772	2,07,325	67,677	54,125	3,29,127
Total	1,28,984	34,257	1,63,241	8,31,148	2,48,524	10,79,672	3,16,215	13,95,887	9,60,132	2,82,781	3,16,215	15,59,12

J. LeMESURIER, Colonel, R. E.,
Superintending Engineer for Irrigation in Sind.

TABLE V.

Cultivation, Canal Revenue and Expenditure for 1885-86 as contrasted with three previous years.

	Canals and Executive Districts.	Average of 3 previous years.			Percentage of Expenditure on Revenue	Cost of Maintenance per Acre.	1885-86.			Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.	Length in miles of	
		Cultivation.	Canal Revenue.	Maintenance and Revenue Collection.			Cultivation.	Canal Revenue.	Maintenance and Revenue Collection.			Canals	Bunds.
		Acres.	Rs.	Rs.			Acres.	Rs.	Rs.				
Begári Canals.	Desert Canal	95,264	1,34,633	31,595	23·47	0·33	85,045	1,15,051	38,928	33·84	0·45	115	...
	Unharwah	..	...	...	...	...	11,831	21,389	9,641	45·07	0·81	67	...
	Begári Canal	153,259	2,41,522	80,256	33·23	0·52	183,353	3,15,868	77,141	24·42	...	169	...
	Kashmor Bund	2,250	4,336	53,125	...	...	5,872	10,980	54,635	...	...	...	48
Shikárpur Canals.	Canals in Rohri	55,244	1,18,288	47,544	40·19	0·86	65,933	1,41,794	68,076	48·01	1·03	240	...
	Bunds in Rohri... ..	3,368	6,647	10,776	...	...	3,749	8,334	4,844	...	...	...	54
	Sind Canal	47,559	1,12,838	29,615	26·24	0·62	56,477	1,38,763	32,076	23·11	0·56	98	...
	Sukkur-Begári Bund ...	...	901	32,744	...	...	...	126	39,437	...	...	...	36
Ghár Canals.	Sukkur Canal	68,522	1,52,512	40,714	26·69	0·59	59,888	1,39,189	40,563	29·14	0·67	127	...
	Ghár	217,432	6,59,687	1,39,523	21·15	0·64	175,503	4,88,100	1,54,666	31·61	0·88	381	...
	Nára	126,627	3,55,000	95,137	26·80	0·75	126,766	3,76,609	90,216	23·93	0·71	238	...
	Wáhur	8,514	20,534	5,721	27·86	0·67	7,001	17,814	3,263	18·31	0·46	23	...
	Marvi	3,629	9,764	2,402	24·60	0 66	3,709	10,863	2,363	21·75	0·63	15	...
	Bunds, right bank ...	41	125	28,818	..	...	105	130	15,615	...	...	...	112
Eastern Nára Canals.	Nara Supply Channel ...	620	4,489	3,192	71·11	5·15	2,742	9,718	5,259	54·12	1·91	12	...
	Eastern Nára	9,206	31,110	16,548	53·19	1·80	12,168	31,588	12,870	40·74	1·05	20	111
	Mithrau Canal	65,018	1,14,121	37,518	32 88	0·33	78,292	1,47,208	45,585	30·96	0·58	141	69
	Thar Canal	16,793	30,542	18,196	59·58	1·08	25,851	42,707	22,130	51·82	0·85	59	33
	Dimwah	1,401	2,300	1,855	80·65	1·32	2,165	3,786	1,393	36·79	0·63	18	...
	Heranwah	316	463	185	39·96	0·59	557	902	90	9·98	0·16	3	...
Hyderabad Canals.	Mehrabwah	10,561	19,262	12,053	62·57	1·14	12,768	23,910	9,352	39·11	0·73	59	...
	Nasrat	17,083	38,584	26,003	67·39	1·52	16,717	39,260	13,671	34·82	0·82	66	...
	Naolakhi...	43,784	96,418	35,294	36·61	0·81	48,184	1,01,843	26,083	25·61	0·54	137	...
	Dámbro	5,713	12,754	7,194	56·41	1·24	6,252	12,945	8,997	69·50	1·43	56	...
	Dad	22,050	40,324	16,790	41·39	0·76	22,532	38,522	14,865	38·59	0·65	105	...
	Rein	11,258	23,532	18,165	76·34	1·61	17,567	33,463	14,053	41·99	0·79	134	...
	Alibhar Kacheri ...	8,532	15,803	6,703	42·49	0·79	8,035	13,831	7,724	55·84	0·96	56	...
	Márak	46,190	90,939	18,857	20·74	0·41	42,963	83,299	16,150	19·39	0 37	194	1
	Gháro Mahmuda ...	56,538	89,752	34,978	38·97	0·62	62,006	95,212	32,549	34·19	0·52	291	...
	Kari Shumali	35,716	41,623	15,258	36·66	0·42	36,024	40,252	16,034	39·83	0·44	214	...
	Nasir	26,013	43,822	21,678	49·47	0·83	25,951	43,357	19,295	44·50	0·74	130	...
	Sarfraz	20,941	27,178	12,055	44·36	0·55	23,427	27,395	11,177	40·79	0·47	116	...
	Other Canals	21,571	46,521	16,538	35·55	0·77	25,781	52,987	18,720	35 33	0·72	112	...
Fuleli Canals.	Fuleli	200,436	3,56,528	1,75,272	49·16	0·87	218,486	3,76,357	1,89,601	50·38	0·86	994	...
	Other Canals	17,253	37,053	24,544	66·24	1·42	15,044	35,889	19,053	53·09	1·26	153	8
Karáchi Canals.	Nára	77,207	1,57,976	26,579	16·82	0·34	77,271	1,60,409	37,356	23·29	0·48	106	...
	Phitta	6,169	11,639	3,598	30·91	0·58	5,924	9,804	7,572	77·23	1·27	27	...
	Canals north of Kotri ..	14,128	25,296	13,112	51·83	0·93	14,121	23,047	15,663	67·96	1·11	58	...
	Kalri	7,597	16,608	15,435	91·67	2·03	7,391	17,777	13,417	76·04	1·81	136	...
	Baghár	14,746	26,306	12,709	48·31	0·86	16,123	29,083	13,272	45·63	0·82	106	...
	Uchita	10,231	23,393	2,844	12·16	0 28	10,441	24,394	2,462	10·09	0 24	44	...
	Canals in Tatta, &c. ...	8,021	14,009	7,878	56·24	0·98	9,767	18,725	8,410	44·91	0·86	83	...
	Shal Canals	1,046	2,394	3,439	143·65	3·29	3,377	8,113	8,036	99·07	2·37	18	...
	Pinyári	55,393	1,16,689	83,173	71·28	1·50	58,322	1,42,135	65,837	46·32	1·12	328	...
	Canals in Mirpur Batoro	9,457	20,836	10,293	49·40	1·09	9,763	22,742	12,267	53·94	1·25	81	...
	Canals in Sujáwal ...	8,327	13,808	3,066	22·20	0·37	6,750	15,505	5,762	37·16	0·85	35	...
	Satta	7,683	17,303	6,277	36·28	0·82	6,813	17,530	9,048	51·61	1·33	58	...
	Canals in Jati	1,700	3,934	1,323	33·63	0·78	1,374	3,516	2,938	83·56	2·13	11	...
	Khanta	6,086	9,398	8,998	95·74	1·48	5,368	9,003	9,455	105·02	1 76	59	...
	Kokawari	14,765	26,540	4,185	15·77	0·28	13,905	28,792	8,023	27·87	0·58	100	...
	Canals in Shábbandar...	2,418	4,634	3,979	85·87	1·65	2,695	4,303	4,082	94·86	1 51	7	...
	Bunds, left bank ...	781	1,488	38,109	...	...	1,091	2,168	22,297	...	...	...	65
	Bunds, right bank ...	307	197	16,649	...	...	679	745	13,875	...	...	...	37
	Begári Canals	250,773	3,80,491	1,64,977	43·36	0·66	286,101	4.63,288	1,80,345	38·92	0·63	351	48
	Shikárpur Canals... ...	106,171	2,38,674	1,20,679	50·56	1·14	126,159	2,89,017	1,44,433	49·97	1·14	338	90
	Ghár Canals	424,765	11,97,622	3,12,315	26·08	0·74	372,972	10,32,705	3,06,686	29·70	0·82	784	112
	Eastern Nára Canals ...	93,354	1,83,025	77,494	42·34	0·83	121,775	2,35,909	87,327	37·02	0·72	253	213
	Hyderabad Canals	326,950	5,86,512	2,41,566	41·19	0·74	348,207	6,06,276	2,08,670	34·40	0·60	1,670	1
	Fuleli Canals	217,689	3,93,581	1,99,816	50·77	0·92	233,530	4,12,246	2,08,654	50 61	0·89	1,147	8
	Karáchi Canals...	246,062	4,92,448	2,61,646	53·13	1·06	251,175	5,37,791	2,59,772	48·38	1·03	1,257	102
	Total ...	1,665,764	34,72,353	13,78,493	39·70	0·83	1,739,919	35,77,232	13,95,887	37·60	0·80	5,800	574
	Add Agricultural Receipts ...							109					
	Total ...							35,77,341					

J. LEMESURIER, Colonel, R. E.,
Superintending Engineer for Irrigation in Sind.

TABLE VI.

Direct and Indirect Receipts of Canal Revenue for 1885-86.

Canals and Districts.		Water share of net Consolidated Revenue as in Table VII.	Deduct average before improvement.	Balance Irrigation share due to Canals.	Direct Receipts, Hakába and Miscellaneous.	Difference of Assessment on Jághir Land.	Total Direct and Indirect Receipts.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	Desert Canal	93,469	...	93,469	21,582	26,430	1,41,481
	Unharwah	21,389	...	21,389	...	...	21,389
	Begári Canal	2,84,554	24,856	2,59,698	31,314	37,476	3,20,488
	Kashmor Bund	10,812	...	10,812	168	...	10,980
Shikárpur Canals	Canals in Rohri	1,38,879	...	1,38,879	2,915	14,100	1,55,894
	Bunds in Rohri	8,334	...	8,334	...	...	8,334
	Sind Canal	1,33,824	...	1,33,824	4,939	18,528	1,57,291
	Sukkur-Begári Bund	.....	...	.....	126	...	126
Ghár Canals	Sukkur Canal	1,37,501	71,550	65,951	1,688	6,490	74,129
	Ghár	4,81,083	1,16,832	3,64,251	7,017	20,543	3,91,811
	Nára	3,69,262	...	3,69,262	7,347	24,029	4,00,638
	Wáhur	17,140	...	17,140	674	...	17,814
	Marvi	9,892	...	9,892	971	...	10,863
	Bunds, right bank	80	...	80	50	145	275
Eastern Nára Canals	Nára Supply Channel	5,525	...	5,525	4,193	1,583	11,301
	Eastern Nára	18,281	3,444	14,837	13,307	...	28,144
	Mithrau Canal	1,46,411	...	1,46,411	797	...	1,47,208
	Thar Canal	42,291	...	42,291	416	1,032	43,739
	Dimwah	3,780	...	3,780	6	...	3,786
	Heranwah	902	...	902	...	...	902
Hyderabad Canals	Mehrabwah	23,746	...	23,746	164	61	23,971
	Nasrat	38,806	...	38,806	454	1,344	40,604
	Naolakhi	1,00,899	...	1,00,899	944	5,619	1,07,462
	Dámbro	12,884	...	12,884	61	908	13,853
	Dad	36,974	...	36,974	1,548	14,272	52,794
	Rein	33,246	...	33,246	217	257	53,720
	Alibhar Kacheri	13,692	8,427	5,265	139	2,998	8,402
	Márak	81,472	36,459	45,013	1,827	13,296	60,136
	Ghára Mahmuda	91,948	...	91,948	3,264	27,618	1,22,830
	Kari Shumali	38,203	...	38,203	2,049	14,600	54,852
	Nasir	42,843	...	42,843	514	1,598	44,955
	Sarfraz	26,422	11,155	15,267	973	4,165	20,405
	Other Canals	52,168	...	52,168	819	4,464	57,451
Fuleli Canals	Fuleli	3,57,111	1,30,284	2,26,827	19,246	1,04,079	3,50,152
	Other Canals	35,374	...	35,374	515	1,696	37,585
Karáchi Canals	Nára	1,53,830	...	1,53,830	6,579	11,127	1,71,536
	Phitta	9,248	...	9,248	556	1,785	11,589
	Canals north of Kotri	22,572	...	22,572	475	3,612	26,659
	Kalri	17,497	...	17,497	280	827	18,604
	Baghár	28,630	...	28,630	453	3,289	32,372
	Uchita	24,308	...	24,308	86	...	24,394
	Canals in Tatta, &c.	17,011	...	17,011	1,714	1,811	20,536
	Shal Canals	8,113	...	8,113	...	...	8,113
	Pinyári	1,39,505	...	1,39,505	2,630	4,564	1,46,699
	Canals in Mirpur Batoro	22,742	...	22,742	...	...	22,742
	Canals in Sujáwal	15,490	...	15,490	15	63	15,568
	Satta	17,391	...	17,391	139	779	18,309
	Canals in Jati	3,456	...	3,456	60	303	3,819
	Khanta	8,932	...	8,932	71	758	9,761
	Kokawari	28,472	...	28,472	320	...	28,792
	Canals in Sháhbandar	4,197	..	4,197	106	653	4,956
	Bunds, left bank	2,050	...	2,050	118	1,113	3,281
	Bunds, right bank	549	..	549	196	1,100	1,845
Begári Canals		4,10,224	24,856	3,85,368	53,064	63,906	5,02,338
Shikárpur Canals		2,81,037	...	2,81,037	7,980	32,628	3,21,645
Ghár Canals		10,14,958	1,88,382	8,26,576	17,747	51,207	8,95,530
Eastern Nára Canals		2,17,190	3,444	2,13,746	18,719	2,615	2,35,080
Hyderabad Canals		5,93,303	56,041	5,37,262	12,973	91,200	6,41,435
Fuleli Canals		3,92,485	1,30,284	2,62,201	19,761	1,05,775	3,87,737
Karáchi Canals		5,23,993	...	5,23,993	13,798	31,784	5,69,575
	Total	34,33,190	4,03,007	30,30,183	1,44,042	3,79,115	35,53,340
	Add—Agricultural Receipts				109	...	109
	Total				1,44,151	3,79,115	35,53,449

J. LEMESURIER, Colonel, R. E.,
Superintending Engineer for Irrigation in Sind.

TABLE VI A.

Actual Direct and Indirect Receipts of Canal Revenue in 1885-86 as shown in the General Revenue Accounts of Executive Districts prepared by the Examiner, Public Works Accounts.

Canals and Districts.		Water share of net Consolidated Revenue collected.	Deduct average before improvement.	Balance Irrigation share due to Canals.	Direct Receipts —Hakába and Miscellaneous.	Difference of Assessment on Jághir Lands.	Total Direct and Indirect Receipts.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	Desert Canal	1,04,336	.....	1,04,336	21,582	26,430	1,52,348
	Unbarwah	20,869	.....	20,869	.....	.....	20,869
	Begári Canal	2,88,091	24,856	2,63,235	31,314	37,476	3,32,025
	Kashmor Bund	10,812	.....	10,812	168	.....	10,980
Shikárpnr Canals	Canals in Rohri	1,36,666	.....	1,36,666	2,915	14,100	1,53,681
	Bunds in Rohri	8,334	.....	8,334	.....	.....	8,334
	Sind Canal	1,35,356	.....	1,35,356	4,939	18,528	1,58,823
	Sukkur-Begári Bund	.....	.....	.....	126	.....	126
Ghár Canals	Sukkur Canal	1,40,834	71,550	69,284	1,688	6,490	77,462
	Ghár	4,80,814	1,16,832	3,63,982	7,017	20,543	3,91,542
	Nára	3,71,095	.....	3,71,095	7,347	24,029	4,02,471
	Wáhur	17,140	.....	17,140	674	.....	17,814
	Marvi	9,892	.....	9,892	971	.....	10,863
	Bunds, right bank	80	.....	80	50	145	275
Eastern Nára Canals	Nára Supply Channel	5,525	.....	5,525	4,193	1,583	11,301
	Eastern Nára	18,281	3,444	14,837	13,307	.....	28,144
	Mithrau Canal	1,46,094	.....	1,46,094	797	.....	1,46,891
	Thar Canal	41,903	.....	41,903	416	1,032	43,351
	Dimwah	3,780	.....	3,780	6	.....	3,786
	Heranwah	902	.....	902	.....	.....	902
Hyderabad Canals	Mehrabwah	23,775	.....	23,775	164	61	24,000
	Nasrat	39,076	.....	39,076	454	1,344	40,874
	Naolakhi	1,01,318	.....	1,01,318	944	5,619	1,07,881
	Dámbro	12,912	.....	12,912	61	908	13,881
	Dad	37,448	.....	37,448	1,548	14,272	53,268
	Rein	33,594	.....	33,594	217	257	34,068
	Alibhar Kacheri	14,649	8,427	6,222	139	2,998	9,359
	Márak	84,364	36,459	47,905	1,827	13,296	63,028
	Gháro Mahmuda	96,526	.....	96,526	3,264	27,618	1,27,408
	Kari Shumali	38,338	.....	38,338	2,049	14,600	54,987
	Nasir	44,178	.....	44,178	514	1,598	46,290
	Sarfraz	26,449	11,155	15,294	973	4,165	20,432
	Other Canals	53,008	.....	53,008	819	4,464	58,291
Fuleli Canals	Fuleli	3,73,237	1,30,284	2,42,953	19,246	1,04,079	3,66,278
	Other Canals	40,200	.....	40,200	515	1,696	42,411
Karáchi Canals	Nára	1,55,565	.....	1,55,565	6,579	11,127	1,73,271
	Phitta	9,841	.....	9,841	556	1,785	12,182
	Canals north of Kotri	20,976	.....	20,976	475	3,612	25,063
	Kalri	17,966	.....	17,966	280	827	19,073
	Baghár	28,550	.....	28,550	453	3,289	32,292
	Uchita	20,741	.....	20,741	86	.....	20,827
	Canals in Tatta, &c.	17,427	.....	17,427	1,714	1,811	20,952
	Shal Canals	8,243	.....	8,243	.....	.....	8,243
	Pinyári	1,42,963	.....	1,42,963	2,630	4,564	1,50,157
	Canals in Mirpur Batoro	25,600	.....	25,600	.....	.....	25,600
	Canals in Sujáwal	15,336	.....	15,336	15	63	15,414
	Satta	17,294	.....	17,294	139	779	18,212
	Canals in Jati	3,458	.....	3,458	60	303	3,821
	Khanta	9,720	.....	9,720	71	758	10,549
	Kokawari	27,244	.....	27,244	320	.....	27,564
	Canals in Shábhandar	4,494	.....	4,494	106	653	5,253
	Bunds, left bank	2,020	.....	2,020	118	1,113	5,251
	Bunds, right bank	549	.....	549	196	1,100	1,845
Begári Canals		4,24,108	24,856	3,99,252	53,064	63,906	5,16,222
Shikárpur Canals		2,80,356	.....	2,80,356	7,980	32,628	3,20,964
Ghár Canals		10,19,855	1,88,382	8,31,473	17,747	51,207	9,00,427
Eastern Nára Canals		2,16,485	3,444	2,13,041	18,719	2,615	2,34,375
Hyderabad Canals		6,05,635	56,041	5,49,594	12,973	91,200	6,53,767
Fuleli Canals		4,13,437	1,30,284	2,83,153	19,761	1,05,775	4,08,689
Karáchi Canals		5,27,987	.....	5,27,987	13,798	31,784	5,73,569
	Total	34,87,863	4,03,007	30,84,856	1,44,042	3,79,115	36,08,013
	Add Agricultural Receipts				109	.....	109
	Total				1,44,151	3,79,115	36,08,122

J. LeMESURIER, Colonel, R. E.,
Superintending Engineer for Irrigation in Sind.

TABLE VII.

Area of Cultivation and Consolidated Revenue for 1885-86.

Canals and Districts.	Cultivation.			Consolidated Revenue.			Remissions.			Net Consolidated Revenue.	Land Share, 10 per cent.	Water Share, 90 per cent.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.			
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals.												
Desert Canals	47,339	5,786	53,125	96,614	11,472	1,08,086	3,807	424	4,231	1,03,855	10,386	93,469
Unharwah	9,174	2,657	11,831	18,522	5,415	23,937	43	128	171	23,766	2,377	21,389
Begári Canal	118,966	29,821	148,787	2,59,062	63,415	3,22,477	4,244	2,062	6,306	3,16,171	31,617	2,84,554
Kashmor Bund... ...	1,347	4,525	5,872	2,897	9,116	12,013	...	...	...	12,013	1,201	10,812
Shikárpur Canals.												
Canals in Rohri ...	42,037	18,517	60,554	1,08,507	45,919	1,54,426	116	...	116	1,54,310	15,431	1,38,879
Bunds in Rohri... ...	2,654	1,095	3,749	7,189	2,071	9,260	...	...	...	9,260	926	8,334
Sind Canal	43,084	6,558	49,642	1,26,976	21,725	1,48,701	7	..	7	1,48,694	14,870	,33,824
Sukkur-Begári Bund ...	...	...	...	...	...	...	...	..	...	...	...	...
Ghár Canals.												
Sukkur Canal	49,569	8,085	57,654	1,30,183	25,921	1,56,104	676	2,649	3,325	1,52,779	15,278	1,37,501
Ghár	156,901	12,011	168,912	5,86,068	50,224	6,36,292	1,00,645	1,111	1,01,756	5,34,536	53,453	4,81,083
Nára	97,953	20,532	118,485	3,40,224	77,079	4,17,303	5,943	1,069	7,012	4,10,291	41,029	3,69,262
Wáhur	5,859	1,142	7,001	15,559	3,503	19,062	18	...	18	19,044	1,904	17,140
Marvi	2,433	1,276	3,709	6,410	4,581	10,991	...	...	...	10,991	1,099	9,892
Bunds, right bank ...	10	36	46	23	66	89	...	...	...	89	9	80
Eastern Nára Canals.												
Nára Supply Channel ...	316	1,823	2,139	1,034	5,105	6,139	...	...	...	6,139	614	5,525
Eastern Nára	6,110	6,058	12,168	9,909	10,403	20,312	...	...	...	20,312	2,031	18,281
Mithrau Canal	55,729	22,563	78,292	1,25,506	38,403	1,63,909	1,230	...	1,230	1,62,679	16,268	1,46,411
Thar Canal	13,479	11,803	25,282	33,042	17,131	50,173	3,183	...	3,183	46,990	4,699	42,291
Dimwah..	1,992	173	2,165	3,867	333	4,200	...	...	...	4,200	420	3,780
Heranwah	557	...	557	1,002	...	1,002	...	...	...	1,002	100	902
Hyderabad Canals.												
Mehrabwah	10,345	2,398	12,743	22,110	4,393	26,503	28	90	118	26,385	2,639	23,746
Nasrat	15,303	800	16,103	42,001	1,611	43,612	114	380	494	43,118	4,312	38,806
Naolakhi	41,711	3,963	45,674	1,02,710	9,504	1,12,214	104	...	104	1,12,110	11,211	1,00,899
Dámbro	5,253	715	5,968	12,634	1,682	14,316	...	...	...	14,316	1,432	12,884
Dad	15,888	1,986	17,874	35,524	5,616	41,140	...	58	58	41,082	4,108	36,974
Rein	15,252	2,192	17,444	32,469	4,607	37,076	136	...	136	36,940	3,694	33,246
Alibhar Kacheri ...	6,550	102	6,652	14,969	244	15,213	...	...	...	15,213	1,521	13,692
Márak	36,276	682	36,958	89,158	1,367	90,525	...	...	...	90,525	9,053	81,472
Gháro Mahmuda ...	45,350	3,968	49,318	92,787	9,571	1,02,358	194	...	194	1,02,164	10,216	91,948
Kari Shumali	25,221	532	25,753	41,749	1,448	43,197	749	...	749	42,448	4,245	38,203
Nasir	23,086	1,140	24,226	45,223	3,003	48,226	623	...	623	47,603	4,760	42,843
Sarfraz	17,833	792	18,625	27,836	1,628	29,464	106	...	106	29,358	2,936	26,422
Other Canals	28,819	4,782	23,601	46,453	11,685	58,138	175	...	175	57,963	5,795	52,168
Fuleli Canals.												
Fuleli	154,147	17,908	172,055	3,68,133	30,039	3,98,172	1,205	177	1,382	3,96,790	39,679	3,57,111
Other Canals	13,200	1,147	14,347	36,509	2,827	39,336	...	31	31	39,305	3,931	35,374
Karáchi Canals.												
Nára	41,047	30,118	71,165	1,03,306	76,437	1,79,743	6,873	1,948	8,821	1,70,922	17,092	1,53,830
Phitta	3,695	1,255	4,950	7,525	3,278	10,803	527	...	527	10,276	1,028	9,248
Canals north of Kotri ...	9,871	2,006	11,877	21,556	4,273	25,829	749	...	749	25,080	2,508	22,572
Kalri	6,501	518	7,019	17,425	2,016	19,441	...	...	...	19,441	1,944	17,497
Baghár	11,525	3,146	14,671	25,920	6,395	32,315	435	69	504	31,811	3,181	28,630
Uchita	9,190	1,251	10,441	28,359	2,179	30,538	3,529	...	3,529	27,009	2,701	24,308
Canals in Tatta, &c. ...	7,837	1,108	8,945	17,102	3,326	20,428	1,414	113	1,527	18,901	1,890	17,011
Shal Canals	2,422	955	3,377	6,835	2,343	9,178	...	164	164	9,014	901	8,113
Pinyári	54,098	2,328	56,426	1,49,551	8,270	1,57,821	2,479	337	2,816	1,55,005	15,500	1,39,505
Canals in Mirpur Batoro.	8,956	807	9,763	26,032	1,977	28,009	2,370	369	2,739	25,270	2,528	22,742
Canals in Sujáwal ...	5,307	1,414	6,721	14,739	2,930	17,669	442	16	458	17,211	1,721	15,490
Satta	6,247	271	6,518	18,176	1,286	19,462	139	..	139	19,323	1,932	17,391
Canals in Jati	927	290	1,217	3,315	524	3,839	..	...	...	3,839	383	3,456
Khanta	4,880	212	5,092	10,580	816	11,396	1,471	...	1,471	9,925	993	8,932
Kokawari	13,495	410	13,905	31,626	1,240	32,866	1,230	...	1,230	31,636	3,164	28,472
Canals in Shahbandar...	2,353	99	2,452	4,155	725	4,880	217	...	217	4,663	466	4,197
Bunds, left bank ...	516	111	627	2,065	213	2,278	...	...	...	2,278	228	2,050
Bunds, right bank ...	245	...	245	592	18	610	...	...	...	610	61	549
Begári Canals	176,826	42,789	219,615	3,77,095	89,418	4,66,513	8,094	2,614	10,708	4,55,805	45,581	4,10,224
Shikárpur Canals	87,775	26,170	113,945	2,42,672	69,715	3,12,387	123	...	123	3,12,264	31,227	2,81,037
Ghár Canals	312,725	43,082	355,807	10,78,467	1,61,374	12,39,841	1,07,282	4,829	1,12,111	11,27,730	1,12,772	10,14,958
Eastern Nára Canals	78,183	42,420	120,603	1,74,360	71,375	2,45,735	4,413	...	4,413	2,41,322	24,132	2,17,190
Hyderabad Canals	276,887	24,052	300,939	6,05,623	56,359	6,61,982	2,229	528	2,757	6,59,225	65,922	5,93,303
Fuleli Canals	167,347	19,055	186,402	4,04,642	32,866	4,37,508	1,205	208	1,413	4,36,095	43,610	3,92,485
Karáchi Canals... .. .	189,112	46,299	235,411	4,88,859	1,18,246	6,07,105	21,875	3,016	24,891	5,82,214	58,221	5,23,993
Total ..	1,288,855	243,867	1,532,722	33,71,718	5,99,353	39,71,071	1,45,221	11,195	1,56,416	38,14,655	3,81,465	34,33,190

J. LEMESURIER, Colonel, R. E.,

Superintending Engineer for Irrigation in Sind.

TABLE VIII.

Discharges of certain Canals, Areas of Crops of different kinds irrigated, and Duty of Water per cubic foot of supply for Kharíf Season 1885.

Canals and Executive Charges.			Average Discharge per cubic foot per second.	Areas of Land irrigated.				Area of Land irrigated.		Total Area irrigated.	Area Irrigated per cubic foot of supply.
				Jowári.	Bájri.	Rice.	Other Crops.	By Lift.	By Flow.		
				Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
Frontier Upper Sind ...	Begári Canals ...	Desert Canal ...	1,711	40,762	3,424	198	24,769	...	...	69,153	44·92
		Muradwah ...	412	2,894	2,112	74	2,586	...	...	7,666	25·94
		Unharwah	463	4,669	2,315	...	2,191	...	...	9,175	25·55
		Begári Canal ...	4,448	86,003	3,418	7,751	57,732	...	...	154,904	42·27
Shikárpur Collectorate...	Shikárpur Canals ...	Sind Canal ...	1,903	15,143	144	22,811	4,877	...	...	42,975	22·58
	Ghár Canals	Sukkur Canal ...	1,697	10,775	265	27,376	12,234	...	...	50,650	29·85
		Ghár ...	4,170	11,292	609	141,787	7,006	...	...	160,694	38·53
Thar and Párkar ...	Eastern Nára Canals...	Mithrau Canal ...	1,080	125	7,006	40,700	7,846	7,672	48,005	55,677	51·55
Hyderabad Collectorate...	Hyderabad Canals ...	Mehrabwah... ...	412	7,165	2,225	21	934	9,594	751	10,345	25·11
		Nasrat	354	12,187	1,242	55	2,423	11,168	4,739	15,907	44·94
		Naolakhi	961	27,567	5,114	574	10,700	33,676	10,279	43,955	45·74
		Márak	1,650	4,011	23,777	181	15,517	42,756	730	43,486	26·36
		Ghalu	905	1,537	20,748	1	13,139	35,338	87	35,425	39·14
		Nasir	598	849	15,281	9	8,572	24,659	52	24,711	41·32
		Sarfraz	450	404	15,509	11	6,563	22,311	176	22,487	49·97
	Fuleli Canals	Fuleli	5,875	766	35,250	119,180	12,706	47,025	120,877	167,902	28·58
		Imamwah Janobi ...	210	97	4,302	3,266	1,819	6,179	3,305	9,484	45·16
		Sanhi Guni... ...	205	...	94	5,015	37	63	5,083	5,146	25·10
		Sherwah	136	2	13	2,154	46	34	2,181	2,215	16·29
		Aliwah	125	...	5	2,262	7	10	2,264	2,274	18·19

Note.—During the kharíf season lands on the Desert Canal, Muradwah, Unharwah, and the Begári Canal were flooded for rabi cultivation to the extent of 7,717, 3,022, 2,656 and 33,127 acres respectively, so that the duty noted against them is for these areas also. The area of jághír cultivation is included under the head "Other Crops" in the case of the Sukkur and Ghár Canals.

J. LeMESURIER, Colonel, R. E.,
Superintending Engineer for Irrigation in Sind.

TABLE IX.

Rainfall in the Province of Sind for 1885-86.

Collectorates and Tálukas.			April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Total.
			In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Frontier Upper Sind.		Kashmor	0·39	0·23	...	...	1·80	...	...	...	...	0·05	...	0·03	2·50
		Thul	0·14	0·88	...	...	0·66	...	...	...	...	0·83	...	2·03	3·54
		Jacobabad	0·82	1·03	...	...	0·51	...	...	...	0·04	0·38	0·05	0·31	3·14
		Shahdádpur	0·57	1·45	...	...	0·11	...	...	...	...	0·58	...	0·28	2·99
Shikárpur Collectorate.	Shikárpur Canals.	Ubauro	0·46	1·04	...	...	1·00	...	...	...	...	0·69	..	0·07	3·26
		Mirpur	0·66	1·93	0·27	...	1·05	...	...	...	...	0·61	...	0·16	4·68
		Ghotki	0·59	1·03	...	...	1·24	...	...	...	...	0·62	0·06	0·10	3·64
		Rohri	0·40	0·66	0·02	...	1·69	...	...	...	...	0·38	0·02	0·52	3·69
		Shirkárpur	0·65	1·02	...	...	0·12	...	...	...	...	0·55	...	1·49	3·83
		Sukkur	...	0·48	0·05	...	2·41	...	...	...	...	0·41	0·01	0·92	4·28
		Garhi Yásin	0·05	1·39	...	...	0·05	...	...	...	...	0·63	0·01	0·94	4·02
	Ghár Canals.	Ráto-dero	...	2·33	...	...	0·17	...	...	...	...	0·60	...	0·43	3·53
		Lárkhána	0·44	1·35	...	...	0·16	...	...	...	...	0·77	...	0·32	3·04
		Kambar	0·90	0·80	...	...	...	...	...	...	...	0·16	...	0·30	2·16
		Bákráni	0·42	1·43	...	...	...	...	...	...	...	0·34	0·01	0·38	2·58
		Mehar	0·41	0·78	...	0·05	1·33	...	...	...	...	0·26	...	0·14	2·97
		Wárah	0·35	1·40	...	..	0·02	...	...	...	...	0·96	...	0·14	2·87
		Khairpur Nátheshán	0·72	1·07	...	...	0·16	...	...	...	...	0·29	...	0·14	2·38
Thar and Párkar.	Eastern Nára Canals.	Khipra	...	0·61	0·08	...	0·91	...	...	...	...	...	...	0·31	1·91
		Umarkot	...	...	1·20	...	5·51	...	...	...	...	...	...	0·34	6·85
		Mitti	...	5·08	0·55	1·43	·54	..	...	...	...	...	...	0·25	11·85
		Nagar	...	0·36	0·25	1·03	4·0	...	...	...	...	0·07	...	...	9·11
Hyderabad Collectorate.	Hyderabad Canals.	Kandiáro	...	...	...	...	1·00	...	...	...	...	0·14	...	...	1·14
		Nausháhro	...	0·25	...	...	1·65	...	...	...	...	0·30	...	0·20	2·40
		Tháru Sháh	0·23	0·97	0·06	...	1·65	...	...	...	...	0·42	0·03	0·17	3·53
		Moro	...	...	0·20	...	0·71	...	...	...	...	0·65	...	0·11	1·67
		Sákrand	...	0·10	...	...	0·84	...	...	...	...	0·10	...	...	1·04
		Hála	0·30	0·05	0·45	...	1·90	...	...	...	...	...	0·05	0·40	3·15
		Shahdádpur	...	...	0·12	...	1·19	...	...	...	...	...	...	...	1·31
		Tando Adam	0·02	0·32	0·76	...	2·57	...	...	...	...	...	...	0·30	3·97
		Tando Alahyar	...	0·28	5·33	...	2·01	...	...	...	...	...	...	0·95	8·57
		Mirpur Khás	0·02	...	0·74	...	2·61	...	...	...	...	...	0·01	0·53	3·91
	Fuleli Canals.	Hyderabad	0·04	0·53	0·25	...	3·29	...	...	...	...	...	...	0·78	4·89
		Dero Mohbat	...	0·07	...	...	0·13	...	...	...	...	...	...	0·41	0·61
		Tando Bágo	...	1·05	0·30	0·13	4·03	...	...	...	...	...	...	0·04	5·55
		Badin	...	0·53	0·80	...	0·60	...	...	...	...	...	...	...	1·93
		Guni	...	...	...	...	...	..	...	...	...	...	...	...	...
		Tando Muhammad Khán	0·12	0·39	0·99	...	1·63	...	...	..	...	...	...	0·82	3·95
Karáchi Collectorate.	Karáchi Canals.	Dádú	0·22	0·76	...	0·19	0·15	...	...	...	...	0·38	...	0·24	1·94
		Johi	0·76	1·34	...	0·22	0·96	...	...	...	...	0·37	...	0·25	2·90
		Sehwan	0·29	0·15	...	...	0·46	...	...	...	...	0·47	...	0·25	1·62
		Mánjhand	0·23	0·08	0·40	...	0·73	...	...	...	...	...	...	0·18	1·62
		Kotri	0·04	0·92	0·25	...	3·04	...	...	...	...	...	...	1·12	5·37
		Bula Khán	0·42	0·97	0·82	...	1·65	...	...	...	...	...	..	1·30	5·16
		Jerruck	0·14	2·74	0·25	...	1·30	...	...	...	...	...	...	0·60	5·03
		Tatta	0·24	...	0·36	0·01	2·49	...	...	...	...	0·03	...	0·06	3·19
		Sákro	0·65	...	0·47	0·14	3·75	...	...	...	...	0·10	..	...	5·11
		Mirpur Batoro	0·24	0·02	2·22	0·67	2·73	...	...	...	...	0·03	0·06	...	5·97
		Sujáwal	0·26	...	0·15	0·08	5·27	...	...	...	...	...	...	...	5·76
		Sháhbandar	0·05	0·32	0·82	0·11	6·75	..	...	...	...	...	...	...	8·05
		Kotri Ghorábári	0·24	...	1·78	...	4·29	...	...	...	...	...	...	0·07	6·38
		Keti	0·32	0·06	0·38	...	4·24	...	...	...	0·22	0·29	...	0·04	5·55
		Mugalbin	0·02	...	1·00	0·02	5·07	...	...	...	...	...	...	...	6·11
		Karáchi	0·53	...	0·04	...	1·71	...	...	...	...	0·02	...	0·17	2·47

J. LEMESURIER, Colonel, R. E.,
Superintending Engineer for Irrigation in Sind.

General Abstract of Financial Results of Irrigation Works

	WORKS IN									
	MAJOR WORKS—PRODUCTIVE WORKS.					MINOR WORKS AND NAVIGATION—WORKS FOR WHICH CAPITAL				
	Desert Canal.	Unharwah.	Begári Canal.	Eastern Nára Works.	Total.	Sukkur Canal.	Ghár Canal.	Mehrabwah.	Alibhar Kacheri Canal.	Márak Great Canal.
Capital Outlay.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
During year ... Direct ...	17,480	1,18,343	42,580	2,64,048	4,42,451	2,509	.....	...	...	...
During year ... Indirect ...	432	3,001	1,067	6,852	11,352	58	.....	...	...	...
Total	17,912	1,21,344	43,647	2,70,900	4,53,803	2,567	.....	...	...	...
To end of year ... Direct ...	10,85,217	2,95,490	16,00,912	46,30,928	76,12,547	13,28,747	4,15,537	66,018	23,207	1,93,600
To end of year ... Indirect ..	37,461	6,477	47,064	1,73,051	2,64,053	59,966	25,440	1,851	710	7,953
Total ...	11,22,678	3,01,967	16,47,976	48,03,979	78,76,600	13,88,713	4,40,977	67,869	23,917	2,01,553
Gross Revenue.										
uring year ... Direct ...	21,582	...	31,314	18,719	71,615	1,688	7,017	164	139	1,827
uring year ... Indirect ...	1,04,336	20,869	2,63,235	2,13,041	6,01,481	69,284	3,63,982	23,775	6,222	47,905
Total ...	1,25,918	20,869	2,94,549	2,31,760	6,73,096	70,972	3,70,999	23,939	6,361	49,732
To end of year ... Direct ...	93,577	...	1,69,879	5,09,260	7,72,716	10,211	1,75,635	432	9,136	41,248
To end of year ... Indirect ...	11,88,244	20,869	30,68,964	37,53,995	80,32,072	6,41,185	1,02,71,523	58,872	81,061	6,06,677
Total ...	12,81,821	20,869	32,38,843	42,63,255	88,04,788	6,51,396	1,04,47,158	59,304	90,197	6,47,925
Working Expenses.										
During year ... Direct ...	38,928	9,641	77,141	87,327	2,13,037	40,563	1,94,663	9,352	7,724	16,150
During year ... Indirect ...	1,064	229	1,720	2,902	5,915	853	4,058	210	214	327
Total ...	39,992	9,870	78,861	90,229	2,18,952	41,416	1,98,721	9,562	7,938	16,477
End of year ... Direct ...	3,41,190	9,641	16,33,528	21,50,000	41,34,359	7,16,619	27,89,519	38,863	83,069	2,17,875
End of year ... Indirect ...	10,111	229	44,830	97,822	1,52,992	22,248	63,419	903	2,555	5,674
Total ...	3,51,301	9,870	16,78,358	22,47,822	42,87,351	7,38,867	28,52,938	39,766	85,624	2,23,549
Net Revenue.										
During year	85,926	10,999	2,15,688	1,41,531	4,54,144	29,556	1,72,278	14,377	—1,577	33,255
End of year	9,30,520	10,999	15,60,485	20,15,433	45,17,437	—87,471	75,94,220	19,538	4,573	4,24,376
Simple Interest.										
During year	43,059	9,453	63,185	1,79,956	2,95,653	...	.....	...	...	...
End of year	3,95,540	13,085	8,93,527	31,71,348	44,73,500	...	.....	...	...	...
Profit after paying off Interest.										
During year	42,867	1,546	1,52,503	-38,425	1,58,491	...	.....	...	...	...
End of year	5,34,980	-2,086	6,66,958	-11,55,915	43,937	...	.....	...	...	...

Nos.—

(1) Direct outlay under Working Expenses includes share of cost of collection in the Civil Department.

(2) Interest charges on account of works other than Productive Public Works are not shown per Government of India's Circular No. IV. P. W. of 1st May 1884 communicated in G. R. No. 223, dated 23rd idem.

in Sind for and up to the close of 1885-86.

OPERATION.											
ND REVENUE ACCOUNTS ARE KEPT.			Grand Total.	MINOR WORKS AND NAVIGATION—WORKS FOR WHICH ONLY REVENUE ACCOUNTS ARE KEPT.						Expenditure on and Receipts from Agricultural Works for which neither Capital nor Revenue Accounts are kept.		
Surfrazwah.	Fuleli Canal.	Total.		Under Executive Engineer, Shikárpur Canals.	Under Executive Engineer, Ghár Canals.	Under Executive Engineer, Hyderabad Canals.	Under Executive Engineer, Fuleli Canals.	Under Executive Engineer, Karáchi Canals.	Total.		Expenditure.	Receipts.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.
...	...	2,509	4,44,960	...	...	...	...	...	...			
...	...	58	11,410	...	...	...	...	...	...	*Begári Canals.*		
										Kashmor Bund.		
...	...	2,567	4,56,370	...	...	...	...	...	...	Maintenance and Repairs, Kashmor Bund	41,042	
										Maintenance of garden at Badani	466	
1,18,559	9,30,232	30,75,900	1,06,88,447	...	...	...	...	...	...	Rent of Telegraph line and office at Badani ...	1,800	
6,121	33,243	1,35,284	3,99,337	...	...	...	...	...	...	Maintenance and Repairs, Buxaliwah	306	
										General charges for Establishment and Tools and Plant	9,940	
1,24,680	9,63,475	32,11,184	1,10,87,784	...	...	...	...	...	...	Share of collection charges in the Civil Department	1,081	
973	19,246	31,054	1,02,669	7,980	9,042	9,870	515	13,798	41,205		54,635	168
15,294	2,42,953	7,69,415	13,70,896	2,80,356	3,98,207	4,56,398	40,200	5,27,987	17,03,148	*Add*—Irrigation share of Land Revenue	...	10,812
16,267	2,62,199	8,00,469	14,73,565	2,88,336	4,07,249	4,66,268	40,715	5,41,785	17,44,353	Total Begári Canals ...	54,635	10,980
23,924	4,83,954	7,44,540	15,17,256	...	...	...	...	...	...	*Shikárpur Canals.*		
1,39,311	43,25,127	1,61,23,756	2,41,55,828	...	...	...	...	...	...	Sluice in Kasimpur Bund for Ding Forest ...	888	
										Do. in Sukkur Begári Bund for Abad Forest ...	1,517	
1,63,235	48,09,081	1,68,68,296	2,56,73,084	...	...	...	...	...	...	Do. in Koraiwah for Budh Forest	190	
										Maintenance and Repairs, Kasimpur Bund... ...	2,180	
11,177	1,89,601	4,69,230	6,82,267	1,73,217	1,27,394	1,66,774	19,053	3,27,185	8,13,623	General charges for Establishment and Tools and Plant	869	
289	6,006	11,957	17,872	...	...	...	...	...	...			
11,466	1,95,607	4,81,187	7,00,139	1,73,217	1,27,394	1,66,774	19,053	3,27,185	8,13,623	Total Shikárpur Canals..	5,644	12
										Ghár Canals.		
1,50,066	35,03,633	74,99,644	1,16,34,003	...	...	...	...	...	...	Survey of a branch Channel from Sukkur Canal	65	
5,821	1,10,386	2,11,006	3,63,998	...	...	...	...	...	...	Sluice in Jhali Bund for Forest Department ...	790	
1,55,887	36,14,019	77,10,650	1,19,98,001	...	...	...	...	...	...	General charges for Establishment and Tools and Plant	162	
4,801	66,592	3,19,282	7,73,426	1,15,119	2,79,855	2,99,494	21,662	2,14,600	9,30,730	Total Ghar Canals ...	1,017	20
7,348	11,95,062	91,57,646	1,36,75,083	...	...	...	...	...	...	*Eastern Nára District* ...	...	4
										Hyderabad Canals ...	...	4
										Mathematical Instrument Depôt	1,942	...
...	...	...	...	...	...	...	...	...	...	*Superintending Engineer in Sind*	...	69
...	...	...	...	...	...	...	...	...	...	Grand Total ...	63,238	11,089
...	...	...	...	...	...	...	...	...	...			
...	...	...	...	...	...	...	...	...	...			

C. R. HOSKYN, Captain, R. E.,
Officiating Examiner of Public Works Accounts.

Memorandum showing the amount of loss to Canals on account of difference between Assessments of Water-rates on Jághír lands and the Assessments at the ordinary rates in force for Government lands.

	To end of 1884-85.	During 1885-86.	To end of 1885-86.	Remarks.
	Rs.	Rs.	Rs.	
Major Works—Productive Works.				
Desert Canal	(a)87,356	26,430	1,13,786	(a). Rs. 9,672 deducted on account of remissions in the Khelat Territory for previous years granted in 1885-86.
Begári Canal	(b)1,62,787	37,476	2,00,263	(b). Rs. 5,329 do. do.
Eastern Nára Works	7,805	2,615	10,420	
Total Productive Works ...	2,57,948	66,521	3,24,469	
Minor Works and Navigation—Works for which Capital and Revenue Accounts are kept.				
Sukkur Canal	4,986	6,490	11,476	
Ghár Canal	53,698	20,543	74,241	
Mehrabwah	256	61	317	
Alibhar Kacheri Canal	11,522	2,998	14,520	
Márak Great Canal	63,976	13,296	77,272	
Surfrazwah	25,764	4,165	29,929	
Fuleli Canal	5,23,611	1,04,079	6,27,690	
Total Works for which Capital and Revenue Accounts are kept ...	6,83,813	1,51,632	8,35,445	
Works for which only Revenue Accounts are kept.				
Under Executive Engineer, Shikárpur Canals	...	32,628	...	
Do. do. Ghár do.	...	24,174	...	
Do. do. Hyderabad do.	...	70,680	...	
Do. do. Fuleli do.	...	1,696	...	
Do. do. Karáchi do.	...	31,784	...	
Total Works for which only Revenue Accounts are kept ...	...	1,60,962	...	

C. R. HOSKYN, Captain, R. E.,
Officiating Examiner of Public Works Accounts.

STATEMENT No. I B.

Capital Account of Irrigation Works in Sind for and to end of 1885-86.

Name of Work.	During the Year.										To end of the Year.									
	Direct Charges.						Indirect Charges.			Grand Total.	Direct Charges.						Indirect Charges.			Grand Total.
	Works.	Establishment.	Tools and Plant.	Total.	Deduct Receipts on Capital Account.	Total.	Capitalization.	Leave and Pension Allowances.	Total.		Works.	Establishment.	Tools and Plant.	Total.	Deduct Receipts on Capital Account.	Total.	Capitalization.	Leave and Pension Allowances.	Total.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MAJOR WORKS.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
PRODUCTIVE WORKS.																				
In operation.																				
Desert Canal	13,937	3,086	457	17,480	..	17,480	..	432	432	17,912	8,72,862	1,98,112	14,280	10,85,254	37	10,85,217	..	37,461	37,461	11,22,678
Unharwah	96,909	21,434	..	1,18,343	..	1,18,343	..	3,001	3,001	1,21,344	2,48,750	46,259	481	2,95,490	..	2,95,490	..	6,477	6,477	3,01,967
Begári Canal	34,515	7,618	447	42,580	..	42,580	..	1,067	1,067	43,647	13,69,273	2,26,992	4,666	16,00,931	19	16,00,912	4,246	42,818	47,064	16,47,976
Eastern Nára Works..	2,14,249	48,943	856	2,64,048	..	2,64,048	..	6,852	6,852	2,70,900	36,88,951	9,02,068	40,085	46,31,104	176	46,30,928	2,669	1,70,382	1,73,051	48,03,979
Total Major Works ..	3,59,610	81,081	1,760	4,42,451	..	4,42,451	..	11,352	11,352	4,53,803	61,79,836	13,73,431	59,512	76,12,779	232	76,12,547	6,915	2,57,138	2,64,053	78,76,600
MINOR WORKS AND NAVIGATION.																				
Sukkur Canal	2,097	412	..	2,509	..	2,509	..	58	58	2,567	11,10,106	2,05,471	13,330	13,28,907	160	13,28,747	19,775	40,191	59,966	13,88,713
Ghár do.	..	..	..	..	..	..	..	..	..	..	3,38,237	75,554	1,746	4,15,537	..	4,15,537	10,329	15,111	25,440	4,40,977
Mehrabwah	..	..	..	..	..	..	..	..	..	..	52,797	13,199	22	66,018	..	66,018	..	1,851	1,851	67,869
Alibhar Kacheri Canal	..	..	..	..	..	..	..	..	..	..	19,636	3,548	23	23,207	..	23,207	..	710	710	23,917
Márak Great Canal	..	..	..	..	..	..	..	..	..	..	1,59,516	32,719	1,445	1,93,680	80	1,93,600	1,409	6,544	7,953	2,01,553
Surfrazwah	..	..	..	..	..	..	..	..	..	..	1,03,432	15,097	30	1,18,559	..	1,18,559	3,102	3,019	6,121	1,24,680
Fuleli Canal	..	..	..	..	..	..	..	..	..	..	7,71,688	1,57,914	651	9,30,253	21	9,30,232	1,664	31,579	33,243	9,63,475
Total Minor Works and Navigation ..	2,097	412	..	2,509	..	2,509	..	58	58	2,567	25,55,412	5,03,502	17,247	30,76,161	261	30,75,900	36,279	99,005	1,35,284	32,11,184
Grand Total ..	3,61,707	81,493	1,760	4,44,960	..	4,44,960	..	11,410	11,410	4,56,370	87,35,248	18,76,933	76,759	1,06,88,940	493	1,06,88,447	43,194	3,56,143	3,99,337	1,10,87,784

C. R. HOSKYN, Captain, R. E.,
Officiating Examiner of Public Works Accounts.

STATEMENT No. I d.

Statement showing Financial Results of Irrigation Works in Sind for the year ending 31st March 1886.

Realizations under main heads of Revenue and Working Expenses.

Irrigation Works.	Revenue (actual Receipts.)										Working Expenses.																Net Revenue.
	Irrigation.			Navigation.	Plantations.	Water-power.	Miscellaneous.	Total.	Refunds of Revenue.	Gross Revenue less Refunds.	Revenue Management.					Maintenance of Works.									Indirect Charges.	Grand Total Working Expenses.	
											Establishment.				Total Revenue Management.	Establishment.				Works.	Repairs.	Sundries.	Tools and Plant.	Plantations.	Total cost of Maintenance.			
	Water-rates paid directly	Share of Land Revenue.	Total.								Direction.	Executive.	Navigation.	Civil Officers.		Direction.	Executive.	Medical.	Total.								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
	Rs.	Rs.	Rs.		Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
MAJOR WORKS.																											
Productive Works.																											
Desert Canal	21,414	1,04,336	1,25,750	..	..	..	168	1,25,918	..	1,25,918	..	1,793	..	10,451	12,244	1,688	4,121	..	5,809	..	20,607	..	268	..	26,684	1,064	39,992	85,926
Unharwah	..	20,869	20,869	..	..	..	..	20,869	..	20,869	..	..	..	2,087	2,087	476	1,162	..	1,638	..	5,808	..	108	..	7,554	229	9,870	10,999
Begári Canal	30,791	2,63,235	2,94,026	..	84	..	439	2,94,549	..	2,94,549	..	1,793	..	26,728	28,521	3,049	7,446	..	10,495	..	37,898	..	227	..	48,620	1,720	78,861	2,15,688
Eastern Nára Works	361	2,13,041	2,13,402	..	1,111	..	17,247	2,31,760	..	2,31,760	1,810	8,685	..	22,647	33,142	1,764	8,467	..	10,231	..	43,650	..	304	..	54,185	2,902	90,229	1,41,531
Total Major Works ..	52,566	6,01,481	6,54,047	..	1,195	..	17,854	6,73,096	..	6,73,096	1,810	12,271	..	61,913	75,994	6,977	21,196	..	28,173	..	1,07,963	..	907	..	1,37,043	5,915	2,18,952	4,54,144
Minor Works and Navigation.																											
Sukkur Canal	1,055	69,284	70,339	..	202	..	431	70,972	..	70,972	..	..	..	7,038	7,038	2,210	3,885	..	6,095	..	26,796	..	487	197	33,525	853	41,416	29,556
Ghár Canal	2,575	3,63,982	3,66,557	..	1,086	..	3,356	3,70,999	..	3,70,999	..	..	..	36,903	36,903	10,520	18,467	..	28,987	32,597	95,868	108	200	..	1,57,760	4,058	1,98,721	1,72,278
Mehrabwah	..	23,775	23,775	..	..	..	164	23,939	..	23,939	..	..	..	2,377	2,377	448	1,054	..	1,502	..	5,473	..	..	..	6,975	210	9,562	14,377
Alibhar Kacheri Canal	95	6,222	6,317	..	29	..	15	6,361	..	6,361	..	..	..	632	632	456	1,071	..	1,527	..	5,565	..	..	..	7,092	214	7,938	—1,577
Márak Great Canal	1,703	47,905	49,608	..	124	..	..	49,732	..	49,732	..	..	..	4,961	4,961	725	1,610	..	2,335	..	8,854	..	..	..	11,189	327	16,477	33,255
Surfrazwah	583	15,294	15,877	..	270	..	120	16,267	..	16,267	..	..	..	1,588	1,588	616	1,448	..	2,064	..	7,525	..	..	..	9,589	289	11,466	4,801
Fuleli Canal..	15,714	2,42,953	2,58,667	..	1,662	..	1,870	2,62,199	7	2,62,192	..	..	..	25,867	25,867	9,869	33,028	..	42,897	..	1,20,501	..	329	..	1,63,727	6,006	1,95,600	66,592
Total Minor Works & Navigation,	21,725	7,69,415	7,91,140	..	3,373	..	5,956	8,00,469	7	8,00,462	..	..	..	79,366	79,366	24,844	60,563	..	85,407	32,597	2,70,582	108	966	197	3,89,857	11,957	4,81,189	3,19,282
Grand Total ...	74,291	13,70,896	14,45,187	..	4,568	..	23,810	14,73,565	7	14,73,558	1,810	12,271	..	1,41,279	1,55,360	31,821	81,759	..	1,13,580	32,597	3,78,545	108	1,873	197	5,26,900	17,872	7,00,132	7,73,426

C. R. HOSKYN, Captain, R. E.,
Officiating Examiner of Public Works Accounts.

STATEMENT No. II c.

Statement showing the Financial Results of Irrigation Works in Sind for the year ended 1885-86 based on actual receipts.
Principal Results of Operations for the year ended 31st March 1886.

Irrigation Works.	Direct and Indirect Capital outlay to end of 1885-86.	Gross Receipts, Direct and Indirect, from all sources.	Working Expenses, Direct and Indirect.	Net Revenue (excluding charges for Interest.)	Interest at 4 per cent. on Direct Capital outlay at commencement of year and at 2 per cent. on outlay during year.	Surplus Revenue after paying Interest on Direct Capital Outlay.		Excess charge including Interest on Direct Capital Outlay.	
						Amount.	Percentage on total sum at charge.	Amount.	Percentage on total sum at charge.
1	2	3	4	5	6	7	8	9	10
MAJOR WORKS.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	
Productive Works.									
In operation.									
Desert Canal	11,22,678	1,25,918	39,992	85,926	43,059	42,867	3·82	.....	.....
Unharwah	3,01,967	20,869	9,870	10,999	9,453	1,546	0·51	.....	.....
Begári Canal	16,47,976	2,94,549	78,861	2,15,688	63,185	1,52,503	9·25	.....	.....
Eastern Nára Works	48,03,979	2,31,760	90,229	1,41,531	1,79,956	.....	.....	38,425	0·80
Total Major Works ...	78,76,600	6,73,096	2,18,952	4,54,144	2,95,653	1,58,491	2·01	.....	.....
Minor Works and Navigation.									
In operation.									
Sukkur Canal	13,88,713	70,972	41,416	29,556	53,100	.....	.....	23,544	1·70
Ghár do.	4,40,977	3,70,999	1,98,721	1,72,278	16,621	1,55,657	35·30	.....	.....
Mehrabwah	67,869	23,939	9,562	14,377	2,641	11,736	17·29	.....	.....
Alibhar Kacheri Canal	23,917	6,361	7,938	—1,577	928	.....	.....	2,505	10·47
Márak Great do.	2,01,553	49,732	16,477	33,255	7,744	25,511	12·66	.....	.....
Surfrazwah	1,24,680	16,267	11,466	4,801	4,742	59	0·05	.....	.....
Fuleli Canal	9,63,475	2,62,192	1,95,600	66,592	37,209	29,383	3·05	.....	.....
Total Minor Works and Navigation ...	32,11,184	8,00,462	4,81,180	3,19,282	1,22,985	1,96,297	6·11	.....	.....
Grand Total ...	1,10,87,784	14,73,558	7,00,132	7,73,426	4,18,638	3,54,788	3·20	.....	.....

C. R. HOSKYN, Captain, R. E.,
Officiating Examiner of Public Works Accounts.

STATEMENT No. III c.

Demands and Realizations during the year 1885-86 in Sind.

Irrigation Works.	Balance of demands unrealized at commencement of year.	Demands of the Year.				Total including balance at commencement of year.	Deduct Remissions not including cash refunds.	Net Total.	Deduct amount unrealized at close of year.	Actual Receipts of the year.
		Rabi.	Kharif.	Miscellaneous Receipts.	Total.					
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
MAJOR WORKS.										
Productive Works.										
Desert Canal	49,088	4,447	27,313	168	31,928	81,016	10,373	70,643	49,061	21,582
Unharwah	.....	...	...	...	.....	.....	...	.....	.....	.....
Begári Canal...	57,723	3,185	28,355	523	32,063	89,786	6,692	83,094	51,780	31,314
Eastern Nára Works	1	154	345	18,358	18,857	18,858	...	18,858	139	18,719
Total Major Works ..	1,06,812	7,786	56,013	19,049	82,848	1,89,660	17,065	1,72,595	1,00,980	71,615
Minor Works and Navigation.										
Sukkur Canal	194	554	565	633	1,752	1,946	...	1,946	258	1,688
Ghár do.	817	996	1,325	4,442	6,763	7,580	...	7,580	563	7,017
Mehrabwah	.....	...	...	164	164	164	...	164	.....	164
Alibhar Kacheri Canal	307	17	436	44	497	804	...	804	665	139
Márak Great do.	2,119	11	2,234	124	2,369	4,488	...	4,488	2,661	1,827
Surfrazwah	1,305	29	1,468	390	1,887	3,192	...	3,192	2,219	973
Fuleli Canal	11,792	746	15,849	3,532	20,127	31,919	2	31,917	12,671	19,246
Total Minor Works and Navigation.	16,534	2,353	21,877	9,329	33,559	50,093	2	50,091	19,037	31,054
Grand Total ...	1,23,346	10,139	77,890	28,378	1,16,407	2,39,753	17,067	2,22,686	1,20,017	1,02,669

C. R. HOSKYN, Captain, R. E.,
Officiating Examiner of Public Works Accounts.

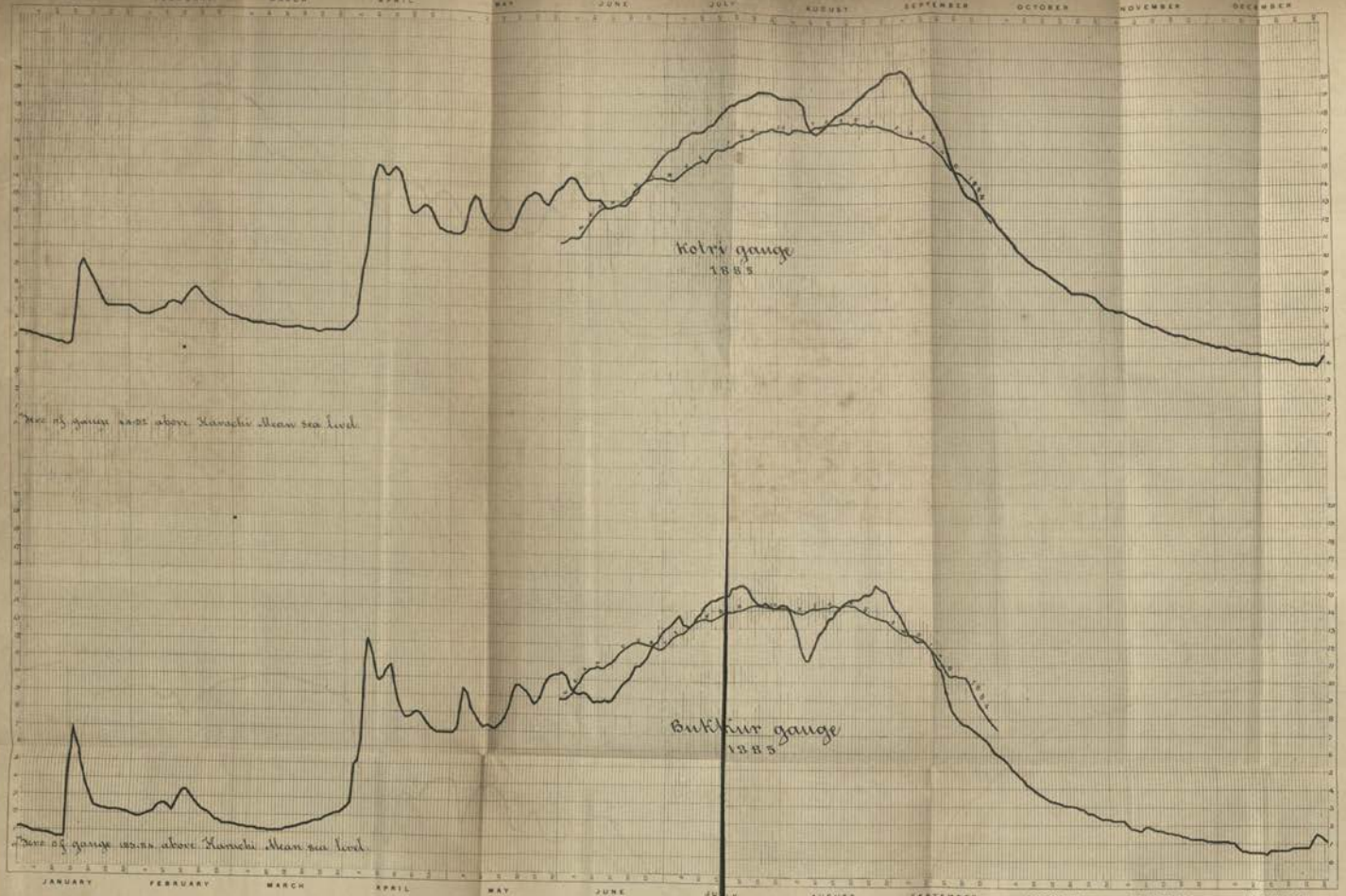
STATEMENT No. IV C.

Statement showing the Financial Results of Irrigation Works in Sind for the year ended 1885-86 based on Assesments of the year. Principal Results of Operations for the year ended 31st March 1886.

Irrigation Works.	Capital outlay (Direct and Indirect) to end of year.	Revenue assessed during the year.								Working Expenses, Direct and Indirect.	Net assessed Revenue of the year.	Percentage on Capital outlay to end of year.
		Direct assessed Revenue.							Indirect Revenue, Land Revenue due to operation of Canal.	Grand Total.			
		Occupier's Rate.	Owner's Rate.	Plantations.	Water-power.	Navigation.	Miscellaneous.	Total.					
	Rs.	Rs.		Rs.			Rs.	Rs.	Rs.	Rs.	Rs.	R.	Rs.
MAJOR WORKS.													
Productive Works.													
Desert Canal	11,22,678	31,760	...	...	...	...	168	31,928	93,469	1,25,397	39,992	85,405	7·61
Unharwah	3,01,967	...	...	...	...	...	.....	.....	21,389	21,389	9,870	11,519	3·81
Begári Canal	16,47,976	31,540	...	84	...	...	439	32,063	2,59,698	2,91,761	78,861	2,12,900	12·92
Eastern Nára Works	48,03,979	499	...	1,111	...	...	17,247	18,857	2,13,746	2,32,603	90,229	1,42,374	2·96
Total Major Works ...	78,76,600	63,799	...	1,195	...	...	17,854	82,848	5,88,302	6,71,150	2,18,952	4,52,198	5·74
Minor Works and Navigation.													
Sukkur Canal	13,88,713	1,119	...	202	...	...	431	1,752	65,951	67,703	41,416	26,287	1·89
Ghár Canal	4,40,977	2,321	...	1,086	...	...	3,356	6,763	3,64,251	3,71,014	1,98,721	1,72,293	39·07
Mehrabwah	67,869	...	...	...	...	...	164	164	23,746	23,910	9,562	14,348	21·14
Alibhar Kacheri Canal	23,917	453	...	29	...	...	15	497	5,265	5,762	7,938	−2,176	9·09
Márak Great do.	2,01,553	2,245	...	124	...	...	.....	2,369	45,013	47,382	16,477	30,905	15·33
Surfrazwah	1,24,680	1,497	...	270	...	...	120	1,887	15,267	17,154	11,466	5,688	4·56
Fuleli Canal	9,63,475	16,595	...	1,662	...	...	1,870	20,127	2,26,827	2,46,954	1,95,600	51,354	5·33
Total Minor Works and Navigation ...	32,11,184	24,230	...	3,373	...	...	5,956	33,559	7,46,320	7,79,879	4,81,180	2,98,699	9·30
Grand Total ...	1,10,87,784	88,029	...	4,568	...	...	23,810	1,16,407	13,34,622	14,51,029	7,00,132	7,50,897	6·77

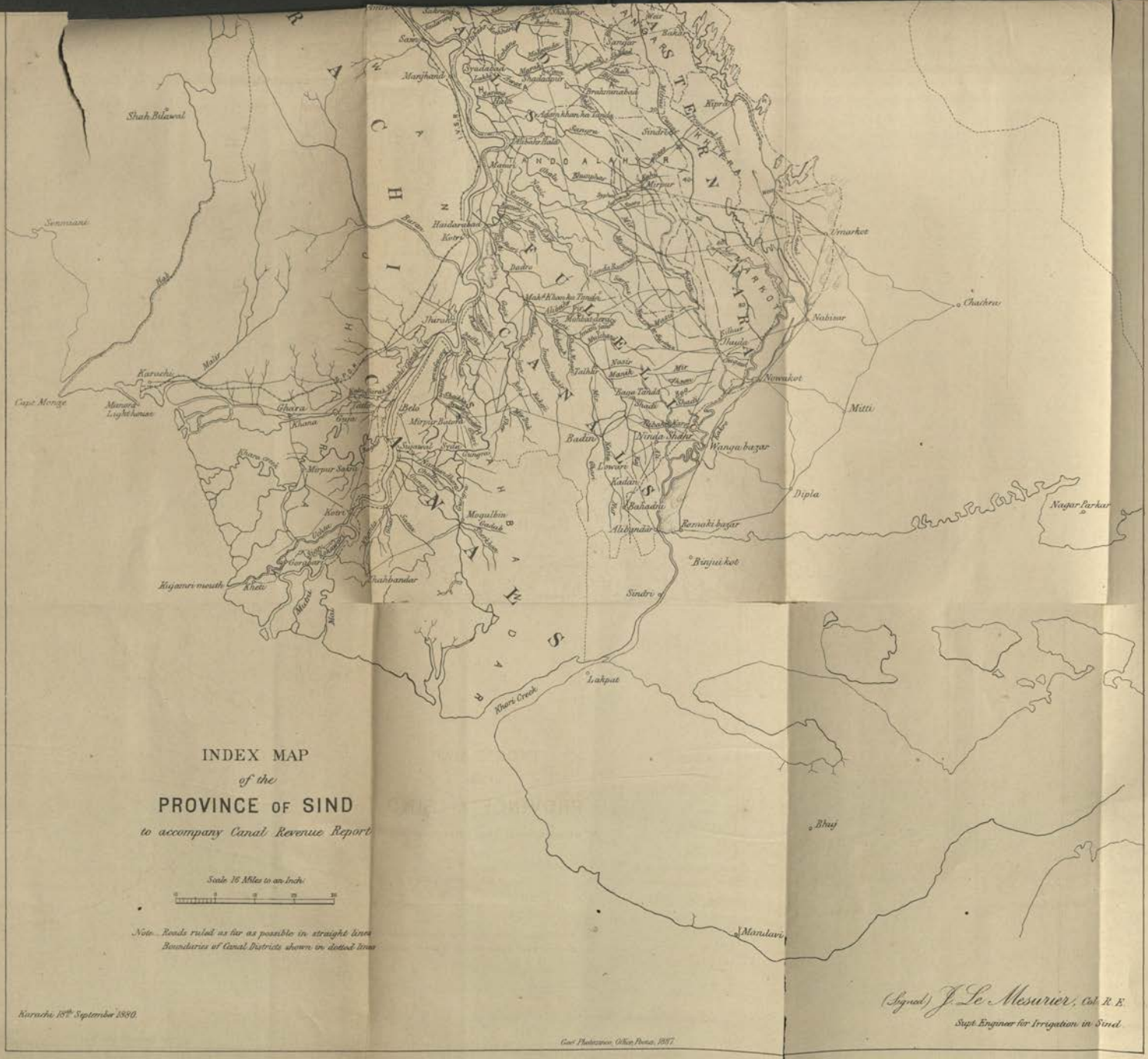
C. R. HOSKYN, Captain, R. E.,
Officiating Examiner of Public Works Accounts.

BOMBAY: PRINTED AT THE GOVERNMENT CENTRAL PRESS.



Col. R E.
Superintending Engineer
for Irrigation
in Sind.

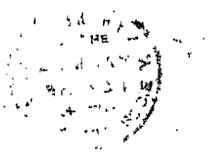
Temple devi
Jhatpat
Jacobabad
Begari
Shikarpur
Khairpur
Sukkur
Larkana
Nasirabad
Mehar
Kakar
Fulji
Johi
Dadu
Mora
Chini
Shah Hasan
Jhangara
Kazi Ahmad
Lakki
Amri
Sakrand
Sann
Manjhand
Shah Bilawal
Sonmiani
Hyderabad
Tando Allahyar
Mirpur
Umarkot
Chachra
Kot Imamgarh
Kot Diji
Jamuji
Sangar
Kandiara
Naushara
Nawabshah
Tando Adam
Sindri
Kipra
Bakar
Sangar
Brahmanabad
Shadadpur
Syadabad
Hala
Matari
Hardarabad
Kotri
Dadu
Tharu
Nabisar
Khairpur
Ghotki
Mirpur
Ubauro
Kashmore
Sukkur
Rohri
Sangrar
Eastern Nara
Desert Canal
Desert Canals
Begari Canals
Sind Canal
Sukkur Canal
Lower Sind Canal
Ghar Canal
Kakar Canal
Nara Canal
Hyderabad Canal
Eastern Nara Canal
Sangar Canal
Kirpra Canal
Umarkot Canal
Nabisar Canal
Chachra Canal
Kakar Range
Ghar Range
Nara Range
Kirthar Range
Eastern Nara
Indus
Hab
Baran
Sukh
Sui


INDEX MAP
of the
PROVINCE OF SIND
to accompany Canal Revenue Report
Scale 16 Miles to an Inch.
Note. Roads ruled as far as possible in straight lines
Boundaries of Canal Districts shown in dotted lines
Karachi 18th September 1880.
(Signed) J. Le Mesurier, Col. R.E.
Supt. Engineer for Irrigation in Sind.
Shah Bilawal
Sonmiani
Cape Monze
Manora Lighthouse
Karachi
Malir
Ghara
Khana
Gujar
Jhirak
Belo
Mirpur Batoro
Mirpur Sakro
Kotri
Kharo creek
Mogulbin
Gedak
Khaki
Khaki creek
Kujanri mouth
Shahbandar
Jherruck
Marjhand
Saeed
Gyadabad
Shahdadpur
Brahmanabad
Adamkhan ka Tando
Sanjro
Sindri
Kipro
Umarkot
Chaihra
Nabisar
Newakot
Mitti
Wanga bazar
Dipla
Nagar Parkar
Rennaki bazar
Mithrao
Badin
Lowaire
Kadan
Bahadur
Mithundar
Tando Shahu
Tando Jam
Tando Ghulam Ali
Tando Allahyar
Tando Mahomed Khan
Hyderabad
Kotri
Deadro
Jherruck
Tando Adam
Tando Jan Mahomed
Tando Mir Mahomed
Tando Ghulam Hyder
Tando Muhammad Khan
Tando Allahyar
Tando Mahomed Khan
Nasir
Manik
Mir
Jagir
Shadi
Shahu
Ninda Shahu
Tando Jam
Tando Ghulam Ali
Tando Allahyar
Tando Mahomed Khan
Tando Adam
Tando Jan Mahomed
Tando Mir Mahomed
Tando Ghulam Hyder
Tando Muhammad Khan
Tando Allahyar
Tando Mahomed Khan
Hyderabad
Kotri
Deadro
Jherruck

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1886-87.



[Price—5 Annas.]

BOMBAY BRANCH
OF THE
Royal Asiatic Society.
CLASS

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1886-87.

B 1131

INDEX.

	PAGES
General review of the results for the whole Province of Sind	1 to 9
Begári Canals	9 & 10
Shikárpur Canals	10 & 11
Ghár Canals	11 & 13
Eastern Nára Canals	13
Hyderabad Canals	13 & 14
Fuleli Canals	14 & 15
Karáchi Canals	15 & 16
Letter from the Superintending Engineer for Irrigation in Sind, No. 2670, dated 23rd December 1887	17
Memorandum from the Commissioner in Sind, No. 162, dated 16th January 1888	17 & 18
Tables I to IX	19 to 27
General Abstract of Financial Results for and up to the close of 1886-87 ...	28 & 29
Memorandum of loss to Canals on account of difference between assessments of water-rates on Jághir lands and the assessments at the ordinary rates in force for Government lands	30
Statements Nos. I B, I C, II C, III C, and IV C	31 to 35
Chart showing reading at Kotri and Bukkur Gauges for 1886.	
Index Map of the Province of Sind.	

ANNUAL REVENUE REPORT

OF THE

IRRIGATION DEPARTMENT IN SIND

FOR 1886-87.

The inundation of 1886 may be classed as very good. The Indus showed indications of an early rise in the month of May; but such a rise is not always an indication of a good inundation, because a too early rise often exhausts the source of supply and leaves the river low in the month of June when cultivating operations are commencing. Several fluctuations in the height of the river took place between the 15th of May and the 15th of June, from which date the steady permanent rise for the season commenced. The river then continued to rise until the 22nd of July, when it reached 16′ 3″ on the Bukkur gauge: a greater height than has ever before been recorded, except in 1882, when it reached a height of 17′ 7″ on the 7th of August in that year.

2. The chart attached to this report shows the curve of the river for the inundation of 1886, both at Bukkur and Kotri, as compared with the mean curve for the last ten years, and it compares very favourably on both gauges. Although the highest level of water at Bukkur was on the 22nd of July, it did not reach its greatest height on the Kotri gauge until the 20th of August. It is also perceived that the downward tendency of the river at Bukkur commenced as early as the 14th of August actually before it reached its full height at Kotri, and while the Bukkur gauge shows that the river fluctuated there from the 15th of August until the 15th of September below the mean of the curve for the past ten years, it did not fall at Kotri as low as the mean curve until the 20th of September, showing an interval of quite a month in both the rise and fall of the river between Bukkur and Kotri. In examining the chart of the river curve for the past ten years, it is seen that in 1885, for the first time, these long intervals appeared between the rise and fall, as indicated first by the Bukkur gauge and afterwards at Kotri. The interval in that year was a month, or the same as in the year under report. Even in 1882, a year of excessive flood, the interval between the rises or falls on the upper and lower gauge was only 7 days, and in other years the difference was indicated in as short a time as 3 days, and was never longer than 10 days.

3. The inference which may be drawn from the steady rise in the river continuing at Kotri for quite a month after the initial supply had commenced to fail at Bukkur is that the embankments along the river banks are yearly becoming more perfect and consolidated and confine the water to a certain and more regular course and prevent its spread in destructive floods over all the low lands between Bukkur and Sehwan. In former years before the bunds or embankments were extended, and had reached the almost perfect state they are in at present, whenever the height of the river was much above the mean curve, floods were a certain consequence; and as they escaped into the depressions far and near, on both banks, with no possibility of returning to the river, nothing beyond the ordinary supply passed down to Kotri. The ordinary supply, or any ordinary wave which rises at Bukkur from a sudden rainfall in the hills or locally, and which is not so great as to overflow the banks of the actual river channel, passes down to Kotri in from 3 to 5 days, but if the wave at Bukkur is large and continues long enough, it causes a lateral overflow, which is now stopped by the bunds, heads up on both sides of the running channel, and practically remains stationary as in a reservoir. On the initial supply failing and the river dropping, the vast store of water contained between the bunds, and which used to flood and devastate large tracts of cultivable land, now returns to the river in such quantities that it keeps the supply up in the lower

and narrower reaches of the river long after the first cause of the overflow has ceased. This is the only way in which the continued rise in the curve at Kotri, long after the supply from the upper sources has stopped, can be accounted for. The unusual lengthened supply in the lower reaches of the river also adds to the duration of water in the canals, besides having a very considerable effect in raising the head of supply in them; it therefore may be taken as a matter of fact that the safe maintenance of the river embankments is twofold in good results: first, in protecting the best of the low-lying lands, which can now safely be watered by flow, and allow of their being brought under cultivation with kharif crops in good time; and secondly, in raising and increasing the supply in the inundation water-courses, thereby giving an easier and longer supply to the high lands watered from them by wheel.

4. Towards the close of the inundation the river changed its course near Kashmor, causing a very heavy silt deposit outside and in the head of the Desert Canal, which necessitated a cut being made for a new supply channel 1¼ mile long. Lower down the river encroached on the Kashmor Bund between the 36 and 42½ miles during the height of the inundation, forcing the construction of a new loop bund 6½ miles long at the back of the endangered part. The river continuing from last season to encroach on the right bank above Sukkur endangered a portion of the Begari Bund from the very first rise of the inundation and it was only by constant and careful watching that breaches were prevented. The encroachments of the river above the head of the Ghár continued during the whole season, and injured the Ghár supply considerably. The old Jhali Bund in front of Madaji Station on the North-Western Railway was carried away, and necessitated the construction of new bunds. The river from this point down became steadier in its course, and stopped eroding near the Fordwah mouth, and left the mouth of the Western Nára, where a large Dhund of still and partially clear water formed. The river next commenced to erode its left bank near the mouth of the Dadwah in the Hyderabad Collectorate, carrying away at that point a very fine tract of land quite 3 miles broad and 10 miles long, on which the finest rabi crops used to be cultivated. It then continued more or less to erode the left bank down to opposite Sehwan and the Láki Pass, and carried away a portion of the village of Juth in the Hyderabad Collectorate, which a few years ago was from 7 to 8 miles away from the stream. From that point its tendency has been to the right bank, where it has cut into some of the hard gravelly soil near Buddapur Station on the North-Western Railway. The river eroded a few hundred feet of the new head of the Fuleli, which had not been touched since its construction 31 years ago. In the southern part of the Karáchi Collectorate the old Bukrani Bund had been carried away and a new loop was being constructed, when the river, by one of those sudden and unexpected encroachments it is peculiar for, particularly where the soil is sandy, reached and cut away the ground the new bund was being constructed on, and did some damage by flooding crops in the Ghorabari Táluka.

5. The information given for some years past by General LeMesurier, R. E., in his annual revenue reports on the connection between the Revenue Survey and the Irrigation Department in Sind, showing how much better the results to the revenue are when the rates charged are chiefly based on the facilities for irrigation and the state of repair the canals are kept in, has been so full and voluminous, that it leaves no room for additional or fresh matter being added to that subject. The tables and statements also, in his report of 1885-86, are so full and ably compiled, and give all the information required so clearly, that the same forms have been adopted to fill in with the necessary figures for this report. During the present inspection season, careful notes will be made of all information which may be likely to be useful and interesting for embodiment in the annual Revenue Report; and by the time the submission of the Report comes round again, any fresh information collected will be fully given and explained.

6. The area of cultivation and irrigation share of net consolidated assessment, omitting the cultivation and revenue on jághir land, was as shown below:—

TABLE A.

Years.	Area of Cultivation.			Irrigation Share of net consolidated Assessment.
	Kharif.	Rabi.	Total.	
	Acres.	Acres.	Acres.	Rs.
1881-82	1,260,108	158,821	1,418,929	32,28,947
1882-83	1,281,691	226,601	1,508,292	32,02,048
1883-84	1,197,513	164,594	1,362,107	31,68,358
1884-85	1,353,960	232,319	1,586,279	36,16,370
1885-86	1,288,855	243,867	1,532,722	34,33,190
Average	1,276,425	205,240	1,481,665	33,29,982
1886-87	1,407,778	185,888	1,593,666	35,89,499
Increase or Decrease	+131,353	—19,352	+112,001	+2,59,517

It is seen from the above table that the kharif area for the year has increased, and is above the average by 131,353 acres, and it also shows an increase of 118,923 acres as compared with the previous year. The rabi area however shows a decline: this is due partly in the case of inundation canals, where rabi is credited to them, to the increased protection afforded by the river embankments, which of course restricts the overflow of the river and flooding of adjoining lands, and partly to the falling off of cultivation on the Desert, Begári, and Ghár canals. The increase in the irrigation share of the net consolidated revenue on the average of the five previous years is Rs. 2,59,517; and compared with 1885-86 there is an increase of Rs. 1,56,309, a result which must be considered satisfactory, particularly as the increase is only less by Rs. 26,871 as compared with 1884-85, in which year the canal revenue had reached a maximum.

7. The table below shows the area of cultivation and irrigation share of net consolidated assessment for 1886-87 as compared with the year 1885-86 :—

TABLE B.

Canals and Districts.	1885-86.		1886-87.		Results.	
	Cultivation, Kharif and Rabi.	Irrigation Share of net Consolidated Revenue.	Cultivation, Kharif and Rabi.	Irrigation Share of net Consolidated Revenue.	Cultivation, Kharif and Rabi.	Irrigation Share of net Consolidated Revenue.
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
Begári Canals ...	219,615	4,10,224	204,225	3,69,932	—15,390	—40,292
Shikárpur Canals .	113,945	2,81,037	118,623	3,08,363	+4,678	+27,326
Ghár Canals ...	355,807	10,14,958	371,011	10,39,583	+15,204	+24,625
Eastern Nára Canals	120,603	2,17,190	133,189	2,56,550	+12,586	+39,360
Hyderabad Canals.	300,939	5,93,303	309,572	6,00,052	+8,633	+6,749
Fuleli Canals ...	186,402	3,92,485	214,266	4,74,182	+27,864	+81,697
Karáchi Canals ...	235,411	5,23,993	242,780	5,40,837	+7,369	+16,844
Total ...	1,532,722	34,33,190	1,593,666	35,89,499	60,944	+1,56,309

All the canal districts except the Begári show an increase of revenue. This is due strictly to increased area of cultivation and the good inundation supply during the kharif season. The falling off in the Begári Canals district is due to a smaller area having been cultivated on the Desert and Begári Canals, the reasons for which are more fully given further on. The supply of water passing

through the sluices which admit water directly through the Kashmor Bund was also insufficient: this can only be accounted for by the fact that the set of the Indus at the mouth of the Desert Canal and along the line of the Kashmor Bund was unfavourable, causing heavy deposits of silt near the regulators. The water supply below the 38th mile of the Begári failed through the silting of the head, and caused considerable loss of cultivation on the tail of the canal.

8. The net canal revenue made up of the irrigation share of net consolidated assessments and hakába from jághirs and miscellaneous receipts, as compared with the figures for the five previous years, is shown below :—

TABLE C.

Years.	Begári Canals.	Shikárpur Canals.	Ghár Canals.	Eastern Nára Canals.	Hyderabad Canals.	Fuleli Canals.	Karáchi Canals.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1881-82 ...	2,65,078	2,40,293	10,99,398	1,75,404	5,94,086	4,03,576	5,67,906	33,45,741
1882-83 ...	3,59,321	2,33,721	11,89,426	1,42,283	5,91,206	3,64,535	4,58,352	33,38,844
1883-84 ...	3,41,953	2,12,270	11,23,953	1,85,596	5,48,060	4,21,324	4,73,896	33,07,052
1884-85 ...	4,40,198	2,70,080	12,79,629	2,21,203	6,20,269	3,94,915	5,46,872	37,73,166
1885-86 ...	4,63,288	2,89,029	10,32,725	2,35,913	6,06,280	4,12,246	5,37,860	35,77,341
Average ...	3,73,968	2,49,079	11,45,026	1,92,080	5,91,980	3,99,319	5,16,977	34,68,429
1886-87 ...	4,52,919	3,14,457	10,54,490	2,74,272	6,24,242	5,02,296	5,55,309	37,77,985
Total ...	+78,951	+65,378	-90,536	+82,192	+32,262	+1,02,977	+38,332	+3,09,556

The results shown in the above table are very satisfactory, the increase compared with the average of 5 previous years being Rs 3,09,556, and as compared also with 1884-85, the maximum year, the increase is Rs. 4,819, which shows a large increase in hakába and miscellaneous receipt, and marks the year as the best on record for revenue received from all sources of irrigation, and when compared with the last year it shows an increase of Rs. 2,00,644. The decrease in the Ghár Canals district is due entirely to the heavy remission of Rs. 90,240, which were granted owing to deficient supply in certain parts of the canal, which is explained further on, and if it had not been for these remissions, the irrigation revenue of the Province would have nearly reached a sum of 39 lákhs.

9. The details of the area of cultivation and hakába levied on jághír lands in British territory and in Khelat are shown below :—

TABLE D.

District.	Area cultivated during the year.	Unrealized balance at end of the year.	Assessment of the year.		Total.	Remission during year.	Net total realizable.	Actual realization during year.	Balance outstanding at end of year.
			Area.	Amount.					
	Acres.	Rs.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Khelat	67,225	1,00,169	67,225	67,024	1,67,193	24,942	1,42,251	78,477	63 774
Upper Sind Frontier	838	669	838	397	1,066	...	1,066	716	350
Shikárpur	30,513	1,986	30,513	13,025	15,011	...	15,011	12,892	2,119
Thar and Párkar	1,683	...	1,683	789	789	...	789	771	18
Hyderabad	102,117	27,311	102,117	35,842	63,153	...	63,153	42,294	20,859
Karáchi	18,608	1,332	18,608	6,521	7,853	...	7,853	4,684	3,169
1886-87	220,984	1,31,467	220,984	1,23,598	2,55,065	24,942	2,30,123	1,39,834	90,289
1885-86	207,197	1,30,580	207,197	1,13,802	2,44,382	17,071	2,27,311	95,987	1,31,324
Total ...	+13,787	+887	+13,787	+9,796	+10,683	+7,871	+2,812	+43,847	41,035

On the jághir lands in British territory and in Khelat the area irrigated is fairly increased, and the assessment also. There are no remissions in any of the districts within British territory, but in Khelat the sum of Rs. 24,942 is shown. These remissions seem to be given entirely on the authority of the Political officers in charge of Khelat, notwithstanding many protests by the Executive Engineer Begári Canals, who has constantly refused to certify that these remissions were due to a failure of water supply. The lands watered by the Begári

and Desert Canals in Khelat are not demarcated, nor the crops even properly measured, and the Executive Engineer positively states that the returns showing the extent of the crops are never correct, and that the area is always largely understated. This matter is a most important one; for even if Government wish, for political reasons, to deal with an open hand with the people of Khelat, still a book credit to the canals showing what they are really earning is very necessary. It should be remembered that the canals supplying water to lands in Khelat territory are classed as Major Works, for which funds are borrowed, and from which a reasonable return is expected, and it is very necessary that correct returns of the area watered should be ascertained; and it would be a satisfactory arrangement if the Executive Engineer was allowed a small establishment to measure the lands and ascertain the proper areas watered, as the Executive Engineer of the Eastern Nára does at present. The outstanding balance against the Province is not large and the average is very low. Hyderabad of all the British districts is the highest: but there is no information to hand by which this can be accounted for. The outstanding balance in Khelat is still very high, Rs. 63,774, only Rs. 36,375 under last year. It is very well known that some of the real men owing these outstanding irrecoverable balances are Zamindárs in well-to-do circumstances living within the boundary of this Province, but cultivating under the shadow of cultivators in Khelat; and these men year after year are allowed to carry off the crops, through the inefficiency of the subordinate establishment set to watch crops and collect the revenue. It is a matter requiring clearing up why the Khelat Zamindárs, no matter where they live, should be allowed more latitude in carrying off their crops before paying their assessment than the Sind Zamindárs. Subordinate Revenue officers who allow such wholesale loss, as is shown in the revenue derived from Khelat, cannot at least be very efficient; and there is no doubt that the whole subject of irrigation and revenue derived from it, in the Khelat territory, requires urgent enquiry.

10. The direct and indirect receipts of canal revenue are shown in tables VI and VI A attached to the report. The total for collection and the actual realizations during the year are shown in the table below:—

TABLE E.

Districts.	Total for collection.	Actual realization.	Balance outstanding.	Irrigation share of collection
	Rs.	Rs.	Rs.	Rs.
Upper Sind Frontier	4,23,911	3,99,311	24,600	3,59,380
Shikárpur	15,31,011	15,12,671	18,340	13,61,404
Thar and Párkar	2,70,060	2,70,060	...	2,43,053
Hyderabad	12,41,674	12,13,593	28,081	10,92,233
Karáchi	6,36,100	6,15,066	21,034	5,53,559
Total ...	41,02,756	40,10,701	92,055	36,09,629

The increase in the total outstanding for collection, as compared with the previous year, is Rs. 1,02,991, and the increase in the actual realizations Rs. 1,35,298: these results are satisfactory. The outstanding balance for the year is less by Rs. 32,307 compared with the previous year, and bearing in mind that the total left for collection was a large sum, the outstanding balance now shown is not much.

11. The remissions for 1886-87 and for the six previous years are shown below for each district separately:—

TABLE F.

District.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	Average.	1886-87.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	1,955	...	...	4,685	3,376	10,708	3,454	20,335
Shikárpur Canals ...	1,415	58	842	6,814	369	123	1,603	668
Ghár Canals	12,198	9,268	66,818	17,312	27,585	1,12,111	40,882	92,277
Eastern Nára Canals ...	2,928	2,504	13,476	910	267	4,413	4,083	43
Hyderabad Canals ...	20,216	911	18,817	493	60,391	2,757	17,264	3,418
Fuleli Canals	2,622	2,917	5,248	1,036	3,246	1,413	2,747	707
Karáchi Canals... ...	23,423	19,194	1,06,505	61,621	16,814	24,891	42,075	18,971
	64,757	34,852	2,11,706	92,871	1,12,048	1,56,416	1,12,108	1,36,419

The remission for the year is less by Rs. 19,997 compared with the previous year, but compared with the average it is more by Rs. 24,311. The heaviest remissions were given in the Ghár Canal district, and the reason for this has been explained in the previous paragraph, 8.

12. In the following table is seen the expenditure on maintenance and repairs of all the canals in the Province, on Public Works establishment, and on revenue collection :—

TABLE G.

Years.	Maintenance and Repairs.			Revenue Collection charges.	Total.
	Works.	Establishment.	Total.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1880-81	7,32,956	2,07,752	9,40,708	2,48,897	11,89,605
1881-82	8,86,044	2,12,897	10,98,941	2,74,070	13,73,011
1882-83	8,68,991	2,22,036	10,91,027	2,72,652	13,63,679
1883-84	8,78,816	2,14,128	10,92,944	2,74,762	13,67,706
1884-85	8,53,757	2,13,717	10,67,474	3,36,613	14,04,087
1885-86	8,31,148	2,48,524	10,79,672	3,16,215	13,95,887
Average	8,41,952	2,19,842	10,61,794	2,87,201	13,48,995
1886-87	8,27,922	2,71,930	10,99,852	3,29,394	14,29,246
Difference	—14,030	+52,088	+38,058	+42,193	+80,251

The charges with one exception, that is under head "Works," are above the average, and also higher than the previous year. The increased expenditure under heads Establishment and Revenue Collection, is due to a great extent, in the first place, to the increased outlay on Abkalani establishment for the purpose of watching and doing minor repairs to the protective embankments throughout the Province during the time of the inundation when the great height of the river caused much anxiety as to the safety of some of the bunds. The increased outlay as regards the latter, which is charged at 10 per cent., was as a matter of course due to increased collection of revenue for the year.

13. The total charges against revenue during the year were :—

	Rs.	Rs.
Extensions and Improvements	2,00,615	
Maintenance and repairs	8,27,922	
		10,28,537
Establishment, Public Works	3,21,577	
,, Revenue	3,29,394	6,50,971
		16,79,508

14. The percentage of expenditure on revenue, leaving out the expenditure on extensions and improvements, and taking only the cost of maintenance and repairs, and Public Works and Revenue Establishments, and the cost of maintenance per acre for the year and the six previous years, were as below :—

TABLE H.

Years.	Cultivation.	Net Canal Revenue.	Maintenance and Repairs and Revenue Collection.	Percentage of expenditure on Revenue.	Cost of maintenance per Acre.
	Rs.	Rs.	Rs.		
1880-81	14,92,669	29,44,032	11,89,605	40·41	0·79
1881-82	16,01,986	33,45,741	13,73,011	41·04	0·86
1882-83	16,73,293	33,38,844	13,63,679	40·84	0·82
1883-84	15,40,831	33,07,052	13,67,706	41·36	0·88
1884-85	17,83,173	37,73,166	14,04,087	37·21	0·79
1885-86	17,39,919	35,77,341	13,95,887	39·02	0·80
Average	16,38,645	33,81,029	13,48,996	39·89	0·80
1886-87	18,14,650	37,77,985	14,29,246	37·83	0·80

The above table shows that although the cost of establishment for maintenance and revenue collection was higher than in former years, the percentage was lower, and the cost of maintenance per acre was not above the average.

15. The general abstract of financial results of the irrigation works in the Province for and up to the close of the year under report is appended, and the results recorded therein are summed up in the table below :—

TABLE I.

Class of Works.	Gross Revenue.	Working Expenses.	Net Revenue.	Simple Interest.	Net Profit.
	Rs.	Rs.	Rs.	Rs.	Rs.
Major Works, Productive Works	6,81,883	2,35,776	4,46,107	3,09,199	1,36,908
Minor Works, Irrigation and Navigation, for which Capital and Revenue Accounts are kept	8,98,310	4,40,503	4,57,807	...	4,57,807
Minor Works, Irrigation and Navigation, for which only Revenue accounts are kept.	18,05,069	8,47,630	9,57,437	...	9,57,439
1886-87	33,85,262	15,23,909	18,61,353	3,09,199	15,52,154
1885-86	32,17,918	15,13,762	17,04,156	2,95,653	14,08,503
Difference	+1,67,344	+10,147	+1,57,197	+13,546	+1,43,651

The gross revenue on major works as shown in the above table is Rs. 6,81,883, the working expenses and the simple interest on the expenditure of capital within the year is Rs. 5,44,975, which leaves a clear profit of Rs. 1,36,908 to the works. This no doubt is less than it ought to be, and would have been, had the supply in the Desert and Begári Canals not failed, but still the profits on the whole being about the average of past years, cannot be looked upon as unsatisfactory. The results under other heads are very satisfactory, as it is seen that the gross revenue has increased by Rs. 1,67,344, and the net revenue by Rs. 1,57,197 as compared with the previous year.

16. The following table contrasts the collection under all heads, and the expenditure and percentage for the year under report and four previous years :—

TABLE J.

Class of Works.	Year.	Water Share of net consolidated Revenue collected.	Hakába and Miscellaneous.	Total collected.	Expenditure against Revenue.	Percentage.
		Rs.	Rs.	Rs.	Rs.	
Major Works—Productive works.	1882-83 ...	4,03,745	71,548	4,75,293	1,77,859	37·4
	1883-84 ...	4,51,934	68,292	5,20,226	1,79,225	34·4
	1884-85 ...	5,75,528	81,249	6,56,777	2,10,950	32·1
	1885-86 ...	6,29,781	71,615	7,01,396	2,13,057	30·4
	1886-87 ...	6,09,643	1,00,540	7,10,183	2,29,016	32·2
Minor Works and Navigation.	1882-83 ...	26,92,879	65,248	27,58,127	13,26,305	48·1
	1883-84 ...	26,60,560	70,402	27,30,962	13,58,282	49·7
	1884-85 ...	31,18,293	75,547	31,93,840	13,76,024	43·1
	1885-86 ...	28,58,082	72,536	29,30,618	13,46,071	45·9
	1886-87 ...	29,99,986	87,946	30,87,932	14,50,492	46·9
Whole of Sind ...	1882-83 ...	30,96,624	1,36,796	32,33,420	15,04,164	46·5
	1883-84 ...	31,12,494	1,38,694	32,51,188	15,37,507	47·3
	1884-85 ...	36,93,821	1,56,796	38,50,617	15,86,974	41·2
	1885-86 ...	34,87,863	1,44,151	36,32,014	15,59,128	42·9
	1886-87 ...	36,09,629	1,88,486	37,98,115	16,79,508	42·9

It is clearly seen in this table that a falling off has taken place under the head Water-share of net consolidated revenue collected in the case of Major Works; but that on the other hand under the head Hakába and Miscellaneous Receipts, an increase has taken place of Rs. 8,787, which shows an increase of revenue on all previous years excepting 1884 and 1885. The percentage of expenditure on revenue for the Province is 42·9, the same as last year (although the sum expended was larger) and below the average of past years. On the whole, this table shows very satisfactory results from the working of the canals.

17. There were about the average extensions and additions to the length of canals and bunds which call for no special remarks. The actual lengths are shown in Table V. There is no need to dwell on the good these extensions to canals and additions to bunds have been to the cultivators and the certainty of increase to the revenue such slight improvements are. The necessity of continuing these small improvements have constantly been brought to the notice of Government, and it would be much to be deplored if money is not forthcoming for them each year. The protective embankments which are advancing to a state of perfection in Upper Sind are, I am sorry to say, still in a backward position in Lower Sind, and the remarks in some of the Settlement officers' last reports show how absolutely necessary the extension and thorough care of these bunds are to secure the results anticipated under the revenue settlement and rates newly introduced into the southern tálukas. It is to be hoped that the small sum asked for for this class of works may be given with certainty and punctuality, and kept quite separate from the amount of nine lákhs required for silt clearance and ordinary maintenance, and that a fair amount of latitude may be given to the Irrigation officers in expending the money on such works as they, in consultation with the Revenue officers, know from experience to be the most beneficial to the revenue and agriculturists. These works do not admit of the strict rules being applied to them, that new Major Works require.

18. The discharges of some of the canals are shown in Table VIII. There is so much dependent on the set of the river Indus in Sind which materially affects the discharge of each canal, that it is not surprising that sometimes canals with the very same section, depth, and fall, differ from one another in their average discharge. A canal fed from a Dhund or a backwater is sure to have

a better supply than from the river direct; as the steady supply in a Dhund is free from heavy silt and always remains steady as the river fluctuates; besides, a canal fed from a Dhund flows much better in the late season than a canal fed direct from the river. The average discharge per cubic feet per second in 1885 was less than that of 1886 in most cases: therefore the increase of cultivation not being very excessive in 1886, the duty shown to each canal is something less than in the past year.

19. The rainfall during the year was small, being only an average—4 inches 98 cents—for the entire Province. The greatest fall was in the Thar and Párkar districts and the southern portions of the Karáchi Collectorate in the month of July. The rain did some damage to bunds in the Karáchi District, as it chanced to fall just as the river was at its greatest height. Rain in July, when the river is low, is most useful in Sind; but when the river is high it proves otherwise, particularly in the districts where the canals run between bunds on their banks, as the cultivators immediately cease watering their fields, in which case the water rises in the canals to such a height that it bursts the banks and does damage more or less to lands and crops.

BEGA'RI CANALS.

20. *Desert Canal.*—Water was admitted into the Desert Canal on the 25th May, and up to the 15th August it was sufficient for all requirements. After that date the supply above the 45th mile was insufficient, and by the end of August very few kurriahs were flowing above the 50th mile, but the supply from the 50th mile to the tail or 69th mile was sufficient up to the middle of September. The deficient supply in the upper part of the canal was due principally to the unfavourable set of the Indus at the mouth of the canal. About the end of July it was found that the Indus was eroding its right bank above the canal and depositing silt in the mouth of the canal, and by the middle of August the mouth and for 7 miles down had silted to a depth of 4 or 5 feet; a sand bank also had commenced to form across the mouth outside; but strong groins were put up in the middle of August to clear away a local deposit of silt, and had the desired result. After the middle of August the Indus commenced to fall steadily, and the silt deposit went on increasing, but there was free communication between the canal and the river to the south until the beginning of September, after which the sand bank increased with great rapidity, and in a fortnight it assumed very considerable dimensions. Owing to these drawbacks the agricultural operation of the year was restricted. The falling off in the area irrigated and the irrigation share of revenue assessed being respectively 13,557 acres and 28,158 rupees as compared with the previous year. The remission for the year was Rs. 6,806. The area irrigated by the canal in Khelat shows an improvement compared with the previous year, the increase being 4,396 acres.

21. The *Unharwah* worked very satisfactorily throughout the season. Water was admitted on the 30th May and the supply was excellent until the middle of September, after which it fell rapidly and the canal ceased to flow on the 22nd of that month. The area irrigated was 24,322 acres and the water share of net assessed revenue Rs. 43,773, the increase compared with the previous years being 12,491 acres and Rs. 22,384 respectively.

22. The *Begári Canal* was opened on the 10th May for the purpose of filling the North-Western Railway tanks at Humaon, Jacobabad, and Jatpat. The downstream gauge readings at the head Regulator during May averaged 4·45 feet, full supply being 12·02 feet; and although the 19th and 38th mile Regulators were kept closed, the water at the tail of the canal throughout the month of May was above full supply level. The supply was gradually increased, and by the 5th June the downstream gauge at the head Regulator read 7 feet. This caused the water in the Edenwah and tail of the Begári to rise considerably; but still it was not in sufficient quantity to irrigate lands below the 38th mile of the Begári. During several seasons lately the Begári has given a good supply at the tail until long after water was required for kharif cultivation, therefore the Zamíndárs on its tail and on the Edenwah commenced cultivating very late in the season hoping for the usual late supply; however, the full supply could

not be passed down the canal until late in June, to the detriment of the cultivation between the 38th and 57th miles. Arrangements are being made to enable the full supply to be passed down by the 7th of June in future. From the 22nd June until the 13th September the supply was sufficient throughout the main canal and branches: but after that date it fell off rapidly, owing chiefly to the formation of a sand bank at the mouth of the Dhund which supplies the Begári, and partly to the fall in the level of the Indus. Owing to these unforeseen causes the cultivation and revenue of the year shows a decrease of 13,721 acres and Rs. 23,358, as compared with the result of the previous year. Remissions to the extent of Rs. 13,414 were granted. The cultivation on lands in Khelat show however an increase of 3,574 acres as compared with the previous year.

23. The erosion opposite Kashmor caused a good deal of anxiety as regarded the *Kashmor bund*. At the commencement of the season the distance between the bund and the river was only 2,645 feet. By the end of July this was further reduced to 1,610 feet, and erosion in the neighbourhood was going on at the rate of 43 feet a day, a rate at which the bund would have been undermined. On the 6th of September, fortunately, however, the erosion decreased as the season advanced, and there was still 1,200 feet left between the bund and the river at its close. The new loop bund which has been subsequently constructed allows of a large margin of safety.

24. The following table shows the total canal revenue on the canals in the Upper Sind Frontier districts, the cost of maintenance and revenue collection, the total charges against revenue, and the percentages for the year and four previous ones. The figures of expenditure include the cost of maintenance of the Kashmor bund :—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of total charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1882-83	3,34,103	1,64,166	2,60,790	49·1	78·1
1883-84	3,38,979	1,60,780	1,85,468	47·5	54·7
1884-85	4,42,476	1,69,984	1,69,984	38·4	38·4
1885-86	4,77,172	1,80,345	1,80,345	37·8	37·8
1886-87	4,44,542	1,79,780	3,06,078	40·4	68·8

The revenue collected during the year is less by Rs. 32,630 as compared with the previous year: the reason for this falling off has already been fully explained. It shows however an improvement as compared with the three previous years. The expenditure on maintenance and revenue collection is below that of the previous year, although in excess of former years. The total charge against revenue is considerably in excess of former years, and this is due to an outlay of Rs. 1,26,298 on the new loop to the Kashmor bund.

SHIKA'RPUR CANALS.

25. The season's irrigation in this district was a good one and the crops were excellent. The spill or lateral overflow all along the left bank from the British boundary to Rohri was much less than in previous years. The *canals in the Rohri districts* worked well and had a sufficient supply of water, resulting in an increase in both the area irrigated and the revenue assessed of 1,295 acres and Rs. 15,114 as compared with the previous year.

The *bunds in the Rohri districts* stood well, and the few leaks which occurred were detected in time and promptly closed. The sluices which pass through these bunds worked well, and gave an abundant supply of water both for forests and cultivation. The kharif crops were very good, and a large area was flooded for the rabi cultivation.

26. The *Sind Canal* was opened on the 5th June. The supply was abundant during the months of June, July, and August, but fell in September owing to the silting of the Dhund from which it takes its supply. The supply in the upper part of the canal was better than it had ever been before, and in the first 25 miles, land which had hitherto been always irrigated by wheel, came under flow. Four breaches occurred, three small and one large, but they were all closed without any damage to cultivation or villages. The area of cultivation and revenue has increased by 3,383 acres and Rs. 12,212 as compared with the previous year.

The water reached its highest level on the 23rd July last against the *Sukkur-Begári* bund: it was everywhere lower than last year, with the exception of at the 35th and 36th miles of the bund, where it was slightly higher. One breach occurred in the 36th mile on the 18th July, and was closed by the 26th of the same month; it was 70 feet wide and 14 feet deep. During the season the river changed its course considerably. In the beginning of the season the set of the river was on the 13th, 14th, and 25th miles. Towards the end of July it cut a new channel through a forest called Sháh Belo, straightening its course and throwing up a bank at Old Sukkur. After this there was no marked set on this bank till the early part of October, when it began to erode opposite the 24th mile of the bund, and encroached to within 500 feet of it at the 23rd mile. The sluices in the bund worked well and gave a good supply: some of the later-sown crops suffered through want of a late supply; but in this the cultivators were to blame, as no warning can induce them to commence cultivating operations in good time; still there has been a fair outturn.

27. The financial results for all the canals and bunds in this district for 1886-87 and four previous years are given below:—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of total charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1882-83	2,26,661	1,36,347	1,51,543	60·1	66·8
1883-84	2,14,442	1,10,790	1,61,008	51·2	75·1
1884-85	2,73,536	1,14,899	1,67,241	42·0	61·1
1885-86	2,88,336	1,44,433	1,78,861	50·1	62·0
1886-87	3,18,769	1,62,045	1,84,627	58·3	57·9

The total revenue collected shows an improvement on the past and previous years. The figures under charges are higher than previous years: this is due to increased outlay under both heads of collection and revenue.

GHÁR CANALS.

28. The effect of the inundation on the river bunds of this district may be summed up as follows:—Water reached the 3rd and 5th mile of the *Jhali* bund on the 21st June. There was one small leak in the new loop, but it was detected and closed before any damage occurred. The erosion was very strong against this part of the bund throughout the season, except from the 13th July to 20th August. During the height of the season erosion ceased altogether, the main body of the current passing down a Gharo, taking off about 4 miles higher up the river, and entering the present course of the river about 3 miles below the mouth of the Ghár. So much has been written on the subject of this bund and the action of the river in its neighbourhood that it is unnecessary to say more on the subject. Many leaks occurred in the *Saidabad* and *Magsi* Bunds, but were detected and stopped in time. There was no erosion on the latter till the end of September, from which period the river was very active, about 1,400 feet of the bund between Naogote and Magsi having been undermined and carried away. In the other bunds of the district no leaks of any importance occurred.

29. *Sukkur Canal.*—The bund at the Rahuja mouth of the Sukkur Canal was cut on the 26th May and a supply of 7 feet in depth was admitted on the 7th June. On the 21st June the river began to rise and on the 25th a very full supply 11·50 feet in depth was admitted. This was maintained until the 6th July when it was gradually increased to 12 feet on the 13th of the same month, and from that date up to the 26th August the full supply of 12 feet, which is the greatest supply the canal can carry, was kept up. The supply at the early part of the season was obtained from the backwater in the tail of the Rahuja Dhund at Old Sukkur, and at the end of the season from its mouth about ¼ mile above Aliwahan. The Head Regulator at Sukkur was opened on the 23rd September and was fed from a backwater in the Sukkur pass, comparatively free from silt. The area irrigated and the revenue earned by the canal was respectively 66,204 acres and Rs. 1,61,967 of revenue, against an area of 57,654 acres and a revenue of Rs. 1,37,501 in the past year, showing an increase of 8,550 acres and Rs. 24,466 of revenue. The rabi area for the year is 10,275 acres against 8,085 acres of the previous year. No remissions were granted during the year. The revenue of this canal is below what its working powers are. The small rates charged on lands cultivated in the two seasons of kharif and rabi has the effect of reducing the revenue very considerably. Inquiries are now being made on the subject, which will hereafter form a separate and special report.

30. The *Ghár* was opened on the 16th May. The supply in the upper Ghár was less than last year: but in the lower part below Lárkhána it was greater being increased by the Fordwah supply. The Mirwah and Hirawah branches of the canal did not receive a good supply. The cultivation on the whole shows a small increase of 1,388 acres compared with the previous year: this increase is due apparently to the increased area irrigated by the canal in the frontier districts. The revenue of the year however, as compared with the previous year, shows a decrease of Rs. 1,265, a result very difficult to account for, unless it may be that there was a difference in the class of crops grown on some of the lands, for which a reduction in the rate of assessment was allowed. Remissions to the extent of Rs. 90,240 were granted during the year. The great reduction in cultivation on the average on this canal is not entirely due to a short supply of water, and can only be accounted for by the cultivators dreading a recurrence of last year's failure of supply, and therefore not cultivating their lands, and in some cases to their want of capital, due to the failure of their crops last year.

31. The *Western Nára* Canal was opened on the 5th May, when the supply was good. The embankments stood throughout the season and there were no breaches. The increase in the cultivated area, compared with the previous year, is 5,183 acres, and the increase in the revenue is Rs. 1,697. The increase is a very poor return on so many acres cultivated, but there is no means of explaining this, except that a poorer class of crop than usual was grown, and therefore the rate of assessment reduced, but still the amount of revenue is very low for the extent cultivated. Remissions to the extent of Rs. 2,037 were granted.

32. The financial results for the canals in this district for the year under report and the four previous years are given below :—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of total charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1882-83	11,40,155	3,26,984	3,47,914	28·7	30·5
1883-84	11,30,274	3,04,277	3,23,305	26·9	28·6
1884-85	13,19,002	3,05,683	3,62,399	23·2	27·5
1885-86	10,37,602	3,06,686	3,63,637	29·6	35·0
1886-87	10,62,799	2,81,910	3,21,351	26·5	30·2

The increase in the revenue collected, as compared with the previous year, is Rs. 25,191, and although much less than the average of the 3 previous years, this and the shorter outlay on charges are to a certain extent satisfactory; but still there remains room for great improvement in this district to bring it back to its former prosperity and again raise the revenue to the large average of former years.

EASTERN NÁRA CANALS.

33. The *Supply Channel* at Rohri was bunded on the 21st March in order to carry out alterations to the regulating apparatus, and as soon as the work likely to come under water was completed, the channel was re-opened on the 14th April. No scouring of the banks took place. Throughout the inundation the bridge was worked with two tiers of needles, the lower ones 20′ × 5″ × 5″ and upper ones 10′ × 6″ × 6″. Owing to the river changing its course and deserting Old Sukkur and the inner pass and setting on to Rohri, a large quantity of trees, stumps, and brushwood were carried down the canal, and great difficulty occurred in keeping the bridge clear of this débris. All wheel cultivation on the channel from the bridge to Junaji was very good.

34. The *Mithrau Canal* was not closed during the entire year. The first supply of water which could be utilized for the season reached the Head Regulator on the 19th of April, but there being some repair works in progress, the full supply was not admitted until the 11th May. The supply was ample for all cultivation both on the main canal and branches. No damage occurred to either banks or bunds. The increase in the area irrigated and assessed revenue was respectively 9,415 acres and Rs. 28,176. Water was admitted into the *Thar* Canal on the 21st May. The weeds which had in previous years done damage to some of the branches, and in the tail of the main canal by obstructing the channel were cut away, before any damage resulted this season, with instruments made for the purpose. The result on this canal was a decrease of 2,893 acres and an increase of Rs. 3,627 of revenue as compared with the previous year: this is due to no remissions having been given. There was some increase of revenue on the *Dim* and *Hiran* canals. The result for the whole system of canals was an increase in the area irrigated and assessed revenue of 12,586 acres and Rs. 39,360, which is satisfactory, as compared with the previous year.

35. The financial results for the year under report and the four previous years are shown below:—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of total charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1882-83	1,42,656	69,503	69,503	48·8	48·8
1883-84	1,85,473	76,761	76,761	41·4	41·4
1884-85	2,21,625	86,216	86,216	38·9	38·9
1885-86	2,35,204	87,327	87,327	37·1	37·1
1886-87	2,75,293	91,036	91,036	33·06	33·06

It will be noticed that the increase in the revenue collected, as compared with the previous year, is Rs. 40,089, which is very satisfactory. The increased outlay under charges is small, and was due to increased cost of revenue collection.

HYDERABAD CANALS.

36. There is but little new to be said regarding the canals in this district. The lands in the northern part of the Hyderabad Collectorate are generally

high and watered by wheel; but in some instances where large "Dhoras" or old river beds are found, which can be watered by flow, rice and other wet crops are grown. The indigo crops which formerly were grown to a large extent in these "Dhoras" used to have a very high market value; but through the manufactured indigo being constantly adulterated by the small traders or middlemen, it fell in market value, and as a matter of course the cultivation also fell off. This season the cultivation has again increased, and as it is a most valuable crop to the cultivators, it is to be hoped it will go on. The canals in the two northern tálukas had an excellent supply and gave no trouble. The *Dámbro* failed in the late season through the erosion of the river at its head, which threw much silt into it; but a cut or small channel from the *Dadwah* was opened into it, and gave sufficient supply to save the late crops. The great stretch of land between the river and the Dadwah was washed away, and the river has cut a few hundred feet off the head of the canal, causing much silt deposit all down the canal and branches. The *Reinwah* had a better supply than for the past 20 years, and bunds which had not been in use since the occupation of the country had to be repaired. The *Great Marak*, the *Gháro Mahmuda*, and their branches worked excellently, and the cotton crops, which is the staple crop grown in the district watered by them, were very flourishing and above the average. The canals in the Hyderabad Canal District only want small improvements and a proper and certain yearly clearance of silt to make them the best paying in the whole of Sind, as the country being comparatively free from floods, there is no hindrance to cultivation except want of water supply in the canals. There was a fair share of land flooded for wheat cultivation, to be assisted afterwards by well water, in the northern tálukás. The result of the good inundation is an increase in the area irrigated of 8,633 acres and in the revenue of Rs. 6,749. The financial results of the year and four previous ones are shown below:—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of total charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1882-83	6,02,542	2,41,048	2,42,001	40·1	40·3
1883-84	5,37,269	2,45,808	2,45,808	45·7	45·7
1884-85	6,35,855	2,37,841	2,51,853	37·4	39·6
1885-86	6,18,608	2,08,670	2,11,177	33·7	34·1
1886-87	6,27,340	2,33,164	2,33,164	37·1	37·1

The increase in the collection is Rs. 8,732 as compared with the previous year. The increased outlay under charges is due to excess expenditure under maintenance and revenue collection. The collections will increase year by year as the new rules for collection of revenue from fallow lands are understood by the people.

FULELI CANALS.

37. The river embankments in this district are not extensive, but as the low lands protected by them cover a large tract, the careful maintenance of them is of the utmost importance. They were severely tried by the unusual height of the river, and during a portion of the season great exertions had to be used to prevent their being overtopped, and a strong force of men had to be kept employed to raise the embankments at certain points as the water rose. The few minor canals which take off direct from the river independent of the Fuleli had an excellent supply, in fact more than they could properly carry, as their banks are in a very defective state, being too low; and not having ever been put in proper order, a number of breaches took place, and caused some mischief. The supply and the results therefrom in the *Fuleli* itself, and all the canals and portion of the district to the east has been exceptionally good, the lands being

high and free from floods; but in the Badin Táluka almost every canal was surcharged with water owing to there being no mode of regulating the supply. A quantity of land liable to flood was submerged and rendered unfit for the cultivation of kharif, although there may be some rabi cultivation. A large sand bank formed across the mouth of the old Fuleli, and the main course of the river is now a long way off. The old Fuleli has silted considerably, while the new or southern head has scoured out. The depth of water in the former is only 10 feet against 22 feet in the latter. A very large Abkalani establishment had to be maintained in the district to prevent breaches in bunds, and to close those which took place. It is considered that a clearance of the canals of this district, costing over 3 lákhs above the amount yearly expended, would not be too much to put the canals in thorough order, and it is estimated that such an outlay would give an increased return of at least a lákh of revenue a year, while the cost of keeping the canals in order afterwards would be less than at present. If the canals were once thoroughly cleared, it would, to a great extent, get rid of the cost of closing breaches, and the loss caused by floods from them, also the Abkalani establishment might be much reduced.

38. To sum up, the inundation was a favourable one for irrigation in this district, as all the canals had a good supply and worked very well, the result being an increase in both the area irrigated and revenue assessed of 27,864 acres and Rs. 81,697, as compared with the previous year. The financial results for the year and for the four previous years are shown below :—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of total charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1882-83	3,48,745	1,85,435	1,85,675	53·2	53·2
1883-84	3,69,263	1,81,258	1,81,386	49·0	49·0
1884-85	4,17,606	2,32,754	2,32,754	55·7	55·7
1885-86	4,33,198	2,08,605	2,08,654	48·2	48·2
1886-87	5,07,009	2,14,374	2,14,374	42·2	42·2

The collection for the year is more than the previous year by Rs. 73,811. The increased outlay under charges is due to revenue collection charges on account of increased collection.

KARA'CHI CANALS.

39. All the canals with the exception of the portion of the *Western Nára* in this district worked exceptionally well, and the water supply was good and equal to all demands. The lower portion of the Western Nára which tails into the Munchar Lake is in a great measure dependent on the use made by the cultivators of the water in the Ghár District, in which its head is situated, and also of course to the position of the head with regard to the river. The head did not work well, and it is feared that for some years the bunds on its banks, on the upper portion, have not been in good order, and very likely have been tampered with by the cultivators in order to flood lands in Mehar Táluka for rabi cultivation. At any rate, whatever the cause has been, the supply in the lower part of the canal in this district has been poor for some years, and continues to get worse. The matter is under inquiry, and it may be found necessary to make other arrangements to supply the tail portion to what they are now.

Since the last inundation 12 small canals were handed over to the Zemindars interested in them, thus decreasing the length of Government canals in the district by 37 miles.

Ten private canals were cleared under the rules of the Irrigation Act, and the cost recovered from the owners, which amounted to Rs. 8,400.

40. The river embankments have been considerably strengthened, and many dangerous gaps which existed between outlying bunds, bearing different names, have been filled in. These gaps should originally never have been left, but as some of the bunds were put up by Zemindars and others by Government, there was no common interest in their working until lately. There were a number of breaches throughout the season in various bunds, but in most part they were closed before doing harm. Any floods caused by gaps or breaches unclosed were utilized for rabi cultivation, and recouped the cost of damage done by them.

The embankments were increased in length by the completion of the *Bukhi* and *Lakhi* bunds in Manjhand Táluka; but much is still required in this district to complete the bunds and make them safe.

41. By the middle of May there was sufficient water in most of the canals in this district to allow of seed sowing, but it quickly fell, and until the middle of June the prospects of the inundation were not very bright; but from that time the water rose steadily, and although the final fall commenced a week too soon, the inundation was exceptionally good for this district, and the result of it was an increase in the area irrigated and the revenue assessed of 7,369 acres and Rs. 16,844. The financial results are shown below as compared with the four previous years :—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of total charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1882-83	4,38,558	2,40,196	4,46,738	54·8	56·3
1883-84	4,75,488	2,88,032	3,63,771	60·5	76·5
1884-85	5,40,517	2,56,710	3,16,527	47·5	58·6
1885-86	5,41,894	2,59,772	3,29,127	47·9	60·7
1886-87	5,62,169	2,66,937	3,28,878	47·4	58·5

The increase in the collection for the year, as compared with the previous year, is Rs. 20,275, and this accounts for the increased outlay under charges.

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

Camp Sehwan, 23rd December 1887.

No. 2670 of 1887.

Public Works Department.

From

The SUPERINTENDING ENGINEER for IRRIGATION in SIND;

To

The SECRETARY to GOVERNMENT,
Public Works Department (Irrigation).

Camp Sehwan, 23rd December 1887.

Sir,

I have the honour to forward my Irrigation Revenue Report for 1886-87 with the usual tables, charts, and Index map of Sind.

2. I am sorry that the report is submitted later than it should be, but this delay is in a measure due to the following reasons. The last batch of General Revenue Accounts and General Abstract of Financial Results of the Irrigation Works of the Province were only received from Bombay on the 27th ultimo, but the Examiner Public Works Accounts in sending them on to me observed that the Accountant General, Bombay, had called upon the Collector of Karáchi for an explanation in regard to certain entries in Canal Return VIII-A of the Karáchi Collectorate, and that it had not been received. There were also certain discrepancies discovered in Canal Returns VIII and VIII-A of the Thar and Párkar Districts, so that in order to render my statistics accurate, I had to get these rectified. I may mention also that the report being new to me, took more time to prepare than it otherwise would have done; and besides, I have had recently very heavy current work which took up most of my time.

3. Attached to the report are the General Abstract of Financial results, memorandum showing amount of loss to canals on account of difference between assessments of water rates on jághír lands, and assessments at the ordinary rates in force of Government lands, and Statements I B, I C, II C, III C, and IV C.

I have the honour to be,

Sir,

Your most obedient Servant,

GEO. LAMBERT, M.Inst.C.E.,

Superintending Engineer for Irrigation in Sind.

Through the Commissioner in Sind.

No. 162 of 1888.

Public Works Department.

Commissioner's Office,

Camp Backorah, 16th January 1888.

No. 2670, dated 23rd December 1887, from the Superintending Engineer for Irrigation in Sind forwarding Annual Revenue Report of the Irrigation Department in Sind for 1886-87.

Submitted to Government.

2. The report shows the results of the inundation for 1886, the last for which the arrangements were in the hands of Major-General LeMesurier.

3. The results in all divisions were satisfactory so far as they could be controlled by the Department. The net canal revenue results as given in paragraph 8 are more favourable than in any previous year and are obtained by a general increase in all canal divisions except the Begári, while the results are in all cases

considerably above the average of the previous 5 years except in the Ghár Division. The revenue in this division shows a small increase on the previous year, but it is, owing to the continued erosion of the river at the mouth of the Ghár, some two and a half lákhs below what it should be and has been in previous years. Apparently there was some improvement in the supply last year, but the losses the people had recently suffered prevented this improvement being fully utilized. But for the condition of the Ghár the revenue in the year under report would have been considerably the highest ever realized from irrigation in Sind.

4. The remarks of the Superintending Engineer in his ninth paragraph regarding the state of things in Khelat refer to a matter with which the Commissioner cannot deal. The Superintending Engineer very naturally desires to see a full return allowed on large productive works such as the Desert and Begári canals, but Khelat being independent territory, the arrangements are not altogether in the hands of British officials, and the proposal of the Superintending Engineer that a measuring establishment under the Executive Engineer should be employed on these lands is quite impracticable.

5. The explanation as to the outstandings in the Hyderabad District, referred to in the same paragraph, is that the Superintending Engineer's report is for the financial year ending March 31st, on which date one kharíf and all the rabi instalments are still to be received. On 31st July 1887, the hakába outstanding in the Hyderabad District was Rs. 236-4-6 only.

6. It is not necessary to follow the Superintending Engineer through the details given in the report. The Commissioner would only draw attention to the evidence afforded by paragraph 37 of the necessity of special expenditure on the Fuleli Canal. The matter is already before Government. The necessity for exceptionally heavy expenditure on Abkalani establishment during the actual inundation is also noticeable as in part explaining the smallness of the balance of the clearance grant which remained for the cold weather work which forms a matter for comment in paragraph 1 of Government Resolution No. 147 W. I.—2044, dated 21st December 1887.

7. For the rest the report requires no further comment, and the results obtained are, in the Commissioner's opinion, thoroughly creditable to the Superintending Engineer and the officers under him.

C. B. PRITCHARD,
Acting Commissioner in Sind

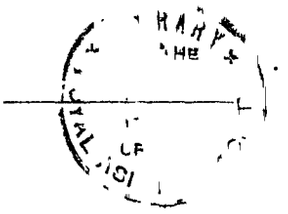


TABLE I.

Cultivation and Water-share of Net Consolidated Revenue for 1886-87 and three previous years.

Canals and Districts.		1883-84.		1884-85.		1885-86.		Average.		1886-87.	
		Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
Begári Canals ..	Desert Canal	55,490	96,341	74,409	1,29,157	53,125	93,169	61,008	1,06,322	39,568	65,311
	Unharwah	..	..	..	..	11,831	21,389	3,944	7,130	24,322	43,773
	Begári Canals	105,302	1,95,030	132,215	2,40,514	148,787	2,84,554	128,768	2,40,032	135,066	2,51,196
	Kashmor Bund	2,122	3,804	3,984	7,158	5,872	10,812	3,993	7,258	5,269	9,652
Shikárpur Canals.	Canals in Rohri	43,691	1,02,392	68,235	1,38,844	60,554	1,38,879	57,493	1,26,705	65,598	1,62,327
	Bunds in Rohri	2,305	5,209	3,977	7,490	3,749	8,334	3,344	7,011	..	..
	Sind Canal	41,184	1,01,464	46,221	1,18,644	49,642	1,33,824	45,682	1,17,977	53,025	1,46,036
	Sukkur-Begári Bund ..	..	..	..	..	..	..	..	..	..	..
Ghár Canals ..	Sukkur Canal	59,630	1,38,145	71,057	1,63,182	57,654	1,37,501	62,780	1,46,276	66,204	1,61,967
	Ghár	194,785	6,39,430	212,574	6,71,131	168,912	4,81,083	192,090	5,97,215	170,300	4,79,818
	Nára	98,518	3,06,992	131,892	3,96,248	118,485	3,69,262	116,298	3,57,501	123,668	3,70,959
	Wáhur	7,100	15,423	8,766	20,946	7,001	17,140	7,623	17,836	6,936	16,671
	Marvi	3,446	9,051	3,744	10,005	3,709	9,892	2,633	9,649	3,816	10,021
	Bunds, right bank	23	95	89	156	46	80	53	110	87	147
Eastern Nára Canals.	Nára Supply Channel .	398	1,027	742	2,005	2,139	5,525	1,093	2,852	1,683	4,334
	Eastern Nára	9,655	16,205	10,098	20,555	12,168	18,281	10,640	18,347	18,438	26,704
	Mithrau Canal	64,969	1,14,513	73,092	1,32,484	78,292	1,46,411	72,118	1,31,136	87,707	1,74,587
	Thar Canal	16,059	29,691	23,176	44,451	25,282	42,291	21,506	38,811	22,389	45,918
	Dimwah	1,276	1,901	1,796	2,844	2,165	3,780	1,746	2,842	2,269	3,832
	Heranwah	225	323	586	818	557	902	456	681	703	1,175
Hyderabad Canals.	Mehrabwah	9,631	19,052	10,092	19,684	12,743	23,746	10,822	20,827	11,858	21,110
	Nasrat	11,746	29,003	16,276	39,933	16,103	38,806	14,478	35,914	17,607	41,876
	Naolakhi	38,152	88,028	45,604	1,03,393	45,674	1,00,899	43,243	97,440	46,018	1,01,022
	Dambro	5,303	12,392	5,166	11,652	5,968	12,884	5,479	12,309	6,872	14,597
	Dad	17,147	37,023	17,233	36,694	17,874	36,974	17,418	36,897	20,637	43,011
	Rein	9,871	21,941	13,516	26,774	17,444	33,246	13,610	27,320	19,193	35,834
	Alibhar Kacheri	7,985	14,164	8,090	16,831	6,652	13,692	7,276	14,896	6,478	13,298
	Márak	39,154	86,269	41,226	88,480	36,958	81,472	39,112	85,407	36,295	80,656
	Gharo Mahmuda	42,302	77,704	52,403	98,437	49,318	91,948	48,009	89,363	46,115	86,741
	Kari Shumáli	28,298	37,981	28,306	40,100	25,753	38,203	27,452	38,761	28,305	37,805
	Nasir	28,041	40,604	25,269	43,419	24,226	42,843	24,178	43,056	25,730	43,401
	Sarfraz	16,698	25,095	19,516	28,187	18,625	26,423	18,279	26,568	19,441	28,598
	Other Canals	17,689	41,642	20,936	45,772	23,601	52,168	20,742	46,528	25,023	52,103
Fuleli Canals ..	Fuleli	162,313	3,55,080	170,477	3,40,844	172,055	3,57,111	168,282	3,51,012	199,157	4,36,882
	Other Canals	16,664	44,909	12,695	31,955	14,347	35,374	14,568	37,413	15,109	37,300
Karáchi Canals ..	Nára	64,100	1,45,383	73,187	1,64,445	71,165	1,53,830	69,514	1,54,536	72,368	1,62,905
	Phitta	4,746	9,048	5,424	10,562	4,950	9,248	5,040	9,619	4,872	9,642
	Canals north of Kotri ..	10,550	20,521	12,597	24,464	11,877	22,572	11,674	22,519	13,385	25,581
	Kalri	5,827	13,790	6,036	15,713	7,019	17,497	6,294	15,667	9,122	20,430
	Baghár	11,908	21,109	12,821	25,268	14,671	28,630	13,133	25,002	17,285	29,569
	Uchita	9,573	21,372	8,804	18,825	10,441	24,308	9,306	21,502	10,742	26,452
	Canals in Tatta &c. ..	5,724	11,406	7,471	15,800	8,945	17,011	7,980	14,739	9,502	17,515
	Shal Canals	1,023	1,639	2,115	5,542	3,377	8,113	2,172	5,098	2,814	6,878
	Pinyári	51,331	1,21,790	56,093	1,41,952	56,426	1,39,505	54,617	1,34,416	57,137	1,41,772
	Canals in Mirpur Batoro ..	9,485	23,007	9,193	23,849	9,763	22,742	9,480	23,199	10,068	24,409
	Canals in Sujáwal	6,643	15,503	7,135	17,006	6,721	15,490	6,835	15,999	7,028	16,410
	Satta	6,638	17,265	7,171	17,663	6,518	17,391	6,776	17,439	7,041	18,011
	Canals in Jati	1,202	4,046	1,774	4,396	1,217	3,456	1,398	3,966	1,288	3,268
	Khanta	5,957	8,621	5,207	9,602	5,092	8,932	5,418	9,052	5,000	9,545
	Kokawari	14,145	21,152	15,012	31,587	13,905	28,472	14,354	27,070	11,797	22,000
	Canals in Shahbandar ..	1,870	3,481	2,363	4,622	2,452	4,197	2,229	4,100	2,541	4,124
	Bunds, left bank	418	1,362	418	1,287	627	2,050	485	1,563	..	..
	Bunds, right bank	..	..	..	..	245	549	82	183	790	2,326
Begári Canals		162,914	2,95,175	210,608	3,76,829	219,615	4,10,224	197,712	3,60,742	204,225	3,69,932
Shikárpur Canals		87,180	2,09,065	118,433	2,64,978	113,045	2,81,037	108,519	2,51,693	118,623	3,08,363
Ghár Canals		363,502	11,09,136	428,122	12,61,668	355,807	10,14,958	382,477	11,28,587	371,011	10,39,583
Eastern Nára Canals		92,582	1,63,660	109,490	2,03,157	120,603	2,17,190	107,559	1,94,669	133,189	2,56,550
Hyderabad Canals		265,717	5,30,898	303,638	6,04,356	300,939	5,93,303	290,098	5,76,186	309,577	6,00,052
Fuleli Canals		178,977	3,99,989	183,172	3,72,799	186,402	3,92,485	182,850	3,88,425	214,266	4,74,182
Karáchi Canals		211,235	4,60,435	232,816	5,32,583	235,411	5,23,993	226,487	5,05,670	242,780	5,40,837
	Total ..	1,362,107	31,68,358	1,586,279	36,16,370	1,532,722	34,33,190	1,493,702	34,05,972	1,593,666	35,89,499

TABLE II.

Area of Cultivation and Canal Revenue for 1886-87 and five previous years.

Years.	Cultivation.			Water Share of net Consolidated Revenue.	Hakába.	Miscellaneous.	Total Canal Revenue.
	Government.	Jághír.	Total.				
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1881-82	1,418,929	183,057	1,601,986	32,28,947	74,828	41,966	33,45,741
1882-83	1,508,292	165,001	1,673,293	32,02,048	87,057	49,739	33,38,844
1883-84	1,362,107	178,724	1,540,831	31,68,358	85,134	53,560	33,07,052
1884-85	1,586,279	196,894	1,783,173	36,16,370	1,06,090	50,706	37,73,166
1885-86	1,532,722	207,197	1,739,919	34,33,190	96,037	48,114	35,77,341
Average ...	1,481,666	186,174	1,667,840	33,29,783	89,829	48,817	34,68,429
1886-87	1,593,666	220,984	1,814,650	35,89,499	1,40,028	48,458	37,77,985
Increase or Decrease ...	+112,000	+34,810	+146,810	+2,59,716	+50,199	−359	+3,09,556

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE III.

Area of Cultivation and Canal Revenue for 1886-87.

Canals, Executive Districts, and Collectorates.			Cultivation.			Water Share of net Consolidated Revenue as in Table VII.	Hakába.	Miscellaneous.	Total Canal Revenue.
			Government.	Jághír.	Total.				
			Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Frontier, Upper Sind.	Begári Canals.	Desert Canal	39,568	36,994	76,562	65,311	37,138	210	1,02,659
		Unharwah	24,322	...	24,322	43,773	...	32	43,805
		Begári Canal	135,066	36,894	171,960	2,51,196	44,966	477	2,96,639
		Works for which no Capital Accounts are kept	5,269	...	5,269	9,652	...	164	9,816
Shikárpur Collectorate.	Shikárpur Canals.	Canals in Rohri	65,598	4,978	70,576	1,62,327	2,259	1,544	1,66,130
		Bunds in Rohri	...	...	...	...	...	1	1
		Sind Canal	53,025	5,112	58,137	1,46,036	1,875	259	1,48,170
		Sukkur-Begári Bund	...	...	...	...	...	149	149
		Works for which no Capital Accounts are kept	...	...	...	...	...	7	7
	Ghár Canals	Sukkur Canal	66,204	1,367	67,571	1,61,967	898	323	1,63,688
		Ghár do.	170,300	4,354	174,654	4,79,818	1,874	3,348	4,85,040
		Nára do.	123,668	7,375	131,043	3,70,959	2,822	2,853	3,76,634
		Wáhur do.	6,936	...	6,936	16,671	...	494	17,165
		Marvi do.	3,816	...	3,816	10,021	...	1,679	11,700
		Bunds, right bank	87	47	134	147	22	76	245
		Works for which no Capital Accounts are kept	...	...	...	...	...	18	18
Thar and Párkar.	Eastern Nára Canals.	Nára Supply Channel	1,683	1,455	3,138	4,334	425	4,627	9,386
		Eastern Nára	18,438	...	18,438	26,704	...	10,777	37,481
		Mithrau Canal	87,707	...	87,707	1,74,587	...	894	1,75,481
		Thar Canal	22,389	1,683	24,072	45,918	771	221	46,910
		Dimwah	2,269	...	2,269	3,832	...	2	3,834
		Heranwah	703	...	703	1,175	...	...	1,175
		Works for which no Capital Accounts are kept	...	...	...	...	...	5	5
Hyderabad Collectorate.	Hyderabad Canals.	Mehrabwah	11,858	...	11,858	21,110	...	84	21,194
		Nasrat	17,607	675	18,282	41,876	270	247	42,393
		Naolakhi	46,018	2,698	48,716	1,01,022	1,071	377	1,02,470
		Dámbro	6,872	447	7,319	14,597	121	7	14,725
		Dad	20,637	5,154	25,791	43,011	2,229	238	45,478
		Rein	19,193	40	19,233	35,834	24	308	36,166
		Alibhar Kacheri	6,478	1,323	7,801	13,298	464	15	13,777
		Márak	36,295	5,628	41,923	80,656	2,155	356	83,167
		Gháro Máhmuda	46,115	12,379	58,494	86,741	6,851	1,075	94,667
		Kari Shumáli	28,305	8,948	37,253	37,805	3,545	361	41,711
		Nasir	25,730	2,133	27,863	43,401	1,712	178	45,291
		Sarfraz	19,441	4,853	24,294	28,598	1,089	372	30,059
		Other Canals	25,023	2,036	27,059	52,103	780	261	53,144
		Works for which no Capital Accounts are kept	...	...	...	...	...	...	...
	Fuleli Canals	Fuleli	199,157	54,863	254,020	4,36,882	21,605	5,810	4,64,297
		Other Canals	15,109	940	16,049	37,300	378	321	37,999
		Works for which no Capital Accounts are kept	...	...	...	...	...	...	...
Karáchi Collectorate.	Karáchi Canals.	Nára	72,368	9,041	81,409	1,62,905	1,213	4,694	1,68,812
		Phitta	4,872	762	5,634	9,642	212	227	10,081
		Canals north of Kotri	13,385	1,536	14,921	25,581	456	105	26,142
		Kalri	9,122	362	9,484	20,430	167	264	20,861
		Baghár	17,285	1,364	18,649	29,569	604	185	30,358
		Uchita	10,742	...	10,742	26,452	...	37	26,489
		Canals in Tatta, &c.	9,502	862	10,364	17,515	365	1,231	19,111
		Shal Canals	2,814	...	2,814	6,878	...	...	6,878
		Pinyári	57,137	1,946	59,083	1,41,772	1,158	2,363	1,45,293
		Canals in Mirpur Batoro	10,068	...	10,068	24,409	...	4	24,413
		Canals in Sujáwal	7,028	58	7,086	16,410	9	2	16,421
		Satta	7,041	260	7,301	18,011	17	...	18,028
		Other Canals in Jati	1,288	175	1,463	3,268	65	...	3,333
		Khanta	5,000	278	5,278	9,545	92	...	9,637
		Kokawari	11,797	...	11,797	22,000	...	540	22,540
		Other Canals in Shahbandar	2,541	220	2,761	4,124	106	135	4,365
		Bunds, left bank	...	1,307	1,307	...	121	...	121
		Bunds, right bank	790	437	1,227	2,326	100	...	2,426
		Works for which no Capital Accounts are kept	...	...	...	...	...	...	...
Begári Canals			204,225	73,888	278,113	3,69,932	82,104	883	4,52,919
Shikárpur Canals			118,623	10,090	128,713	3,08,363	4,134	1,960	3,14,457
Ghár Canals			371,011	13,143	384,154	10,39,583	5,616	9,291	10,54,490
Eastern Nára Canals			133,189	3,138	136,327	2,56,550	1,196	16,526	2,74,272
Hyderabad Canals			309,572	46,314	355,886	6,00,052	20,311	3,879	6,24,242
Fuleli Canals			214,266	55,803	270,069	4,74,182	21,983	6,131	5,02,296
Karáchi Canals			242,780	18,608	261,388	5,40,837	4,685	9,787	5,55,309
		Total	1,593,666	220,984	1,814,650	35,89,499	1,40,029	48,457	37,77,985

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE IV.

Revenue Expenditure on New Works, Maintenance and Repairs and Revenue Collection Charges in the Civil Department for 1886-87.

Canals and Executive Districts.	Revenue Expenditure.								Total Revenue Expenditure.			
	Improvements.			Maintenance and Repairs.			Revenue Collection Charges in the Civil Department.	Total.	Works.	Establishment.		Total.
	Works.	Establishment and Tools and Plant.	Total.	Works.	Establishment and Tools and Plant.	Total.				Public Works Department.	Civil Department.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Shikárpur Begári Canals.												
Desert Canal	...	...	...	30,461	10,288	40,749	6,747	47,496	30,461	10,288	6,747	47,496
Unharwah	...	...	...	8,602	2,575	11,177	4,405	15,582	8,602	2,575	4,405	15,582
Begári Canal	...	...	...	40,085	12,905	52,990	21,912	74,902	40,085	12,905	21,912	74,902
Káshmor Bund ...	1,06,386	19,912	1,26,298	34,397	6,438	40,835	965	41,800	1,40,783	26,350	965	1,68,098
Shikárpur Canals.												
Canals in Rohri... ...	2,164	684	2,848	29,359	9,287	38,646	16,694	55,340	31,523	9,971	16,694	58,188
Bunds in Rohri... ...	1,269	401	1,670	3,588	1,134	4,722	...	4,722	4,857	1,535	...	6,392
Sind Canal	13,126	4,191	17,317	23,560	7,396	30,956	15,006	45,962	36,686	11,587	15,006	63,279
Sukkur-Begári Bund ...	568	179	747	42,544	13,477	56,021	...	56,021	43,112	13,656	...	56,768
Ghár Canals.												
Sukkur Canal	...	...	...	15,611	5,185	20,796	9,005	29,801	15,611	5,185	9,005	29,801
Ghár Canal	25,036	7,489	32,525	73,444	21,969	95,413	37,597	1,33,010	98,480	29,458	37,597	1,65,535
Nára	...	...	...	50,382	15,068	65,450	37,569	1,03,019	50,382	15,068	37,569	1,03,019
Wáhur	...	...	...	1,718	514	2,232	1,667	3,899	1,718	514	1,667	3,899
Marvi	...	...	...	1,334	399	1,733	1,169	2,902	1,334	399	1,169	2,902
Bunds, right bank ...	5,324	1,592	6,916	7,130	2,132	9,262	17	9,279	12,454	3,724	17	16,195
Eastern Nára Canals.												
Nára Supply Channel ..	...	...	...	8,259	2,411	10,670	476	11,146	8,259	2,411	476	11,146
Eastern Nára	...	...	...	9,691	3,196	12,887	3,393	16,280	9,691	3,196	3,393	16,280
Mithrau Canal	...	...	...	13,620	11,058	24,678	17,523	42,201	13,620	11,058	17,523	42,201
Thar Canal	...	...	...	9,224	6,668	15,892	4,708	20,600	9,224	6,668	4,708	20,600
Dimwah	...	...	...	236	73	309	383	692	236	73	383	692
Heranwah	...	...	...	...	...	...	117	117	...	...	117	117
Hyderabad Canals.												
Mehrabwah	...	...	...	10,052	2,857	12,909	2,111	15,020	10,052	2,857	2,111	15,020
Nasrat	...	...	...	11,984	3,862	15,846	4,215	20,061	11,984	3,862	4,215	20,061
Naolakhi	...	...	...	15,574	5,019	20,593	10,209	30,802	15,574	5,019	10,209	30,802
Dámbro	...	...	...	6,122	1,973	8,095	1,472	9,567	6,122	1,973	1,472	9,567
Dad	...	...	...	9,505	3,063	12,568	4,525	17,093	9,505	3,063	4,525	17,093
Rein	...	...	...	10,098	3,254	13,352	3,596	16,948	10,098	3,254	3,596	16,948
Alibhar Kacheri ...	...	..	...	4,088	1,161	5,249	525	5,774	4,088	1,161	525	5,774
Márak	...	...	...	8,659	2,460	11,119	4,744	15,863	8,659	2,460	4,744	15,863
Gháro Mahmuda ...	...	...	...	20,639	6,651	27,290	9,348	36,638	20,639	6,651	9,348	36,638
Kari Shumáli	...	...	...	8,193	2,640	10,833	4,204	15,037	8,193	2,640	4,204	15,038
Nasir	...	...	...	10,104	3,256	13,360	4,585	17,945	10,104	3,256	4,585	17,945
Sarfraz	...	..	...	10,628	3,020	13,648	1,919	15,567	10,628	3,020	1,919	15,567
Other Canals	...	..	...	8,743	2,818	11,561	5,288	16,849	8,743	2,818	5,288	16,849
Fuleli Canals.												
Fuleli	...	...	..	1,09,865	38,664	1,48,529	33,029	1,81,558	1,09,865	38,664	33,029	1,81,558
Other Canals	...	..	...	21,263	7,495	28,758	4,058	32,816	21,263	7,495	4,058	32,816
Karáchi Canals.												
Nára	5,995	1,943	7,938	12,181	3,949	16,130	16,898	33,028	18,176	5,892	16,898	40,966
Phitta	..	...	...	1,822	591	2,413	1,019	3,432	1,822	591	1,019	3,432
Canals north of Kotri...	6,907	2,288	9,195	3,465	1,120	4,585	2,686	7,271	10,372	3,408	2,686	16,466
Kalri	...	...	...	5,550	1,897	7,447	2,022	9,469	5,550	1,897	2,022	9,469
Baghár	...	...	...	3,970	1,111	5,081	3,044	8,125	3,970	1,111	3,044	8,125
Uchita	...	...	...	...	...	...	2,759	2,759	...	...	2,759	2,759
Canals in Tatta, &c. ...	...	...	...	1,919	574	2,493	1,900	4,393	1,919	574	1,900	4,393
Shal Canals	...	...	...	1,236	401	1,637	674	2,311	1,236	401	674	2,311
Pinyári	...	...	...	36.662	11,602	48,264	14,541	62,805	36,662	11,602	14,541	62,805
Canals in Mirpur Batoro.	...	...	...	3,999	1,297	5,296	2,513	7,809	3,999	1,297	2,513	7,809
Canals in Sujáwal ...	...	...	...	2,160	766	2,926	1,671	4,597	2,160	766	1,671	4,597
Satta	...	...	...	2,539	823	3,362	1,876	5,238	2,539	823	1,876	5,238
Canals in Jati	...	...	...	123	49	172	336	508	123	49	336	508
Khanta	...	...	...	2,664	864	3,528	1,094	4,622	2,664	864	1,094	4,622
Kokawari	...	...	...	1,879	609	2,488	2,467	4,955	1,879	609	2,467	4,955
Canals in Shahbandar ...	...	...	...	1,226	496	1,722	455	2,177	1,226	496	455	2,177
Bunds, left bank ...	10,000	3,238	13,238	67,608	21,922	89,530	12	89,542	77,608	25,160	12	1,02,780
Bunds, right bank ...	23,840	7,730	31,570	10,157	3,493	13,650	246	13,896	33,997	11,223	246	45,466
Begári Canals	1,06,386	19,912	1,26,298	1,13,545	32,206	1,45,751	34,029	1,79,780	2,19,931	52,118	34,029	3,06,078
Shikárpur Canals	17,127	5,455	22,582	99,051	31,294	1,30,345	31,700	1,62,045	1,16,178	36,749	31,700	1,84,627
Ghár Canals	30,360	9,081	39,441	1,49,619	45,267	1,94,886	87,024	2,81,910	1,79,979	54,348	87,024	3,21,351
Eastern Nára Canals	...	...	...	41,030	23,406	64,436	26,600	91,036	41,030	23,406	26,600	91,036
Hyderabad Canals	...	...	..	1,34,389	42,034	1,76,423	56,741	2,33,164	1,34,389	42,034	56,741	2,33,164
Fuleli Canals	...	...	...	1,31,128	46,159	1,77,287	37,087	2,14,374	1,31,128	46,159	37,087	2,14,374
Karáchi Canals	46,742	15,199	61,941	1,59,160	51,564	2,10,724	56,213	2,66,937	2,05,902	66,763	56,213	3,28,878
Total ...	2,00,615	49,647	2,50,262	8,27,920	2,71,930	10,99,852	3,29,394	14,29,246	10,28,537	3,21,577	3,29,394	16,79,508

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE V.

Cultivation, Canal Revenue and Expenditure for 1886-87 as contrasted with three previous years.

	Canals and Executive District.	Average of three pervious years.			Percentage of Expenditure on Revenue.	Cost of Maintenance per acre.	1886-87.			Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.	Length in miles of	
		Cultivation.	Canal Revenue.	Maintenance and Revenue Collections.			Cultivation.	Canal Revenue.	Maintenance and Revenue Collection.			Canals.	Bunds.
		Acres.	Rs.	Rs.			Acres.	Rs.	Rs.				
Begári Canals.	Desert Canal	92,351	1,28,128	37,454	29·23	0·40	76,562	1,02,659	47,496	46·27	0·62	115	...
	Unharwah	3,944	7,129	3,214	45·08	0·82	24,322	43,805	15,582	35·57	0·64	67	...
	Begári Canal	167,740	2,72,381	76,968	28·26	·46	1,71,960	2,96,639	74,902	25·25	0·44	176	...
	Kashmor Bund	3,993	7,507	52,734	...	...	5,269	9,652	41,800	...	...	...	48
Shikárpur Canals.	Canals in Rohri ...	59,847	1,28,801	55,199	42·86	0·92	70,576	1,66,130	55,340	33·31	0·78	240	..
	Bunds in Rohri... ...	3,344	7,015	6,694	...	...	...	1	4,722	...	...	...	54
	Sind Canal	49,129	1,20,372	28,524	23·70	0·58	58,137	1,48,170	45,962	31·02	0·79	98	...
	Sukkur-Begári Bund ...	...	922	32,957	...	...	...	149	56,021	...	...	...	36
Ghár Canals.	Sukkur Canal	63,887	147,288	34,983	23·75	0·55	67,571	1,63,688	29,801	18·20	0·44	127	...
	Ghár	197,826	603,475	1,45,657	24·14	0·74	174,654	4,85,040	1,33,010	27·42	0·76	381	...
	Nára	125,251	365,659	94,972	25·97	0·76	131,043	3,76,634	1,03,019	27·35	0·79	238	...
	Wáhur	7,622	18,860	4,489	23·27	0·59	6,936	17,165	3,899	22·71	0·56	23	...
	Marvi	3,633	9,973	2,412	24·19	0·66	3,816	11,700	2,902	24·80	0·76	15	...
	Bunds, right bank ...	72	148	23,036	...	...	134	245	9,279	...	...	...	112
Eastern Nára Canals.	Nára Supply Channel...	1,514	6,522	3,102	47·56	2·05	3,138	9,386	11,146	118·75	3·55	12	...
	Eastern Nára	10,640	32,766	15,458	47·18	1·45	18,438	37,481	16,280	43·44	0·88	20	111
	Mithrau Canal	72,118	1,32,093	42,580	32·23	0·59	87,707	1,75,481	42,201	24·05	0·48	152	84
	Thar Canal	22,219	39,327	20,634	52·21	0·93	24,072	46,910	20,600	43·91	0·86	59	33
	Dimwah	1,746	2,845	1,838	64·60	1·05	2,269	3,834	692	18·05	0·30	18	...
	Heranwah	456	681	123	18·06	0·27	703	1,175	117	9·96	0·17	3	...
Hyderabad Canals.	Mehrabwah	10,880	20,791	12,954	61·77	1·19	11,858	21,194	15,020	70·87	1·27	59	...
	Nasrat	14,905	36,497	15,874	43·49	1·06	18,282	42,393	20,061	47·32	1·10	66	...
	Naolakhi	45,579	98,507	28,057	28·48	0·62	48,716	1,02,470	30,802	30·00	0·63	137	...
	Dámbro	5,759	12,432	8,352	67·18	1·45	7,319	14,725	9,567	64·97	1·30	56	...
	Dad	21,557	38,727	18,390	47·49	0·85	25,791	45,478	17,093	37·58	0·66	105	...
	Rein	13,668	27,439	19,651	71·62	1·44	19,233	36,166	16,948	46·86	0·88	134	...
	Alibhar Kacheri ...	8,247	15,170	7,744	51·05	0·94	7,801	13,777	5,774	41·91	0·74	56	...
	Márak	44,957	87,401	18,595	21·28	0·41	41,923	83,167	15,863	19·07	0·38	194	1
	Gharo Mahmuda ...	59,806	93,296	32,936	35·30	0·55	58,494	94,667	36,638	38·70	0·63	291	...
	Kari Shumáli	35,946	41,406	16,506	39·86	0·46	37,253	41,711	15,037	36·05	0·40	214	...
	Nasir	25,607	44,555	21,789	48·90	0·85	27,863	45,291	17,945	39·62	0·64	130	...
	Sarfraz	22,529	27,621	11,936	43·21	0·53	24,294	30,059	15,567	51·79	0·64	116	...
	Other Canals	22,551	47,511	17,990	37·86	0·80	27,059	53,144	16,849	31·70	0·62	112	...
Fuleli Canals.	Fuleli	209,449	3,71,402	1,84,365	49·64	0·88	254,020	464,297	181,558	39·10	0·71	994	...
	Other Canals	15,672	38,094	23,190	60·87	1·48	16,049	37,999	32,816	86·36	2·04	153	8
Karáchi Canals.	Nára	77,918	1,60,536	31,333	13·28	0·40	81,409	1,68,812	33,028	19·56	0·40	112	...
	Phitta	5,955	10,125	4,948	48·87	0·83	5,634	10,081	3,432	34·04	0·61	27	...
	Canals north of Kotri ...	13,810	23,152	15,623	67·48	1·13	14,921	26,142	7,271	27·81	0·49	58	...
	Kalri	6,652	16,095	13,887	86·28	2·09	9,484	20,861	9,469	45·39	1·00	136	...
	Baghár	14,368	25,635	14,837	57·88	1·03	18,649	30,358	8,125	26·76	0·44	106	...
	Uchita	9,606	21,644	2,602	12·02	0·27	10,742	26,489	2,759	10·42	0·26	44	...
	Canals in Tatta, &c. ..	8,163	15,897	8,950	56·30	1·10	10,364	19,111	4,393	22·99	0·42	83	...
	Shal Canals	2,172	5,098	6,118	120·00	2·82	2,814	6,878	2,311	33·60	0·82	18	...
	Pinyári	56,140	1,37,239	69,609	50·72	1·24	59,083	1,45,293	62,805	43·23	1·06	328	...
	Canals in Mirpur Batoro	9,481	23,200	12,063	52·00	1·27	10,068	24,413	7,809	31·99	0·78	81	...
	Canals in Sujáwal ..	6,986	16,015	3,965	24·76	0·57	7,086	16,421	4,597	27·99	0·65	35	...
	Satta	7,046	17,565	8,111	46·18	1·15	7,301	18,028	5,238	29·05	0·72	58	...
	Canals in Jati	1,546	4,019	1,704	42·40	1·10	1,463	3,333	508	15·24	0·35	11	...
	Khanta	5,686	9,125	10,796	118·31	1·90	5,278	9,637	4,622	47·96	0·88	59	...
	Kokawari	14,354	27,396	5,974	21·80	0·42	11,797	22,540	4,955	21·98	0·42	100	...
	Canals in Shahbandar ..	2,433	4,423	4,732	106·99	1·94	2,761	4,365	2,177	49·87	0·79	7	...
	Bunds, left bank ...	863	1,694	36,124	...	...	1,307	121	89,542	...	...	...	65
	Bunds, right bank ...	351	355	16,794	...	...	1,227	2,426	13,896	...	...	...	50
Begári Canals		268,028	4,15,145	1,70,370	41·04	0·64	278,113	4,52,755	1,79,780	39·70	0·65	358	48
Shikárpur Canals		112,320	257,110	1,23,374	47·98	1·10	128,713	3,14,450	1,62,045	51·53	1·26	338	90
Ghár Canals		398,291	11,45,403	3,05,549	26·68	0·77	384,154	10,54,472	2,81,910	26·73	0·73	784	112
Eastern Nára Canals		108,693	2,14,234	83,435	38·95	0·77	136,327	2,74,267	91,036	33·19	0·67	264	228
Hyderabad Canals		331,991	5,91,535	2,30,774	39·01	0·69	355,886	6,24,242	2,33,164	37·35	0·66	1,670	1
Fuleli Canals		225,121	4,09,496	2,07,555	50·69	0·92	270,069	5,02,296	2,14,374	42·68	0·79	1,147	8
Karáchi Canals...		243,530	5,19,213	2,68,170	51·65	1·10	261,388	5,55,309	2,66,937	48·07	1·02	1,263	115
Total ...		1,687,974	35,52,136	13,89,227	39·11	0·82	18,14,650	37,77,791	14,29,246	37·83	0·79	5,824	602
								Agricultural Receipts ..	194				
									37,77985				

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE VI.

Direct and Indirect Receipts of Canal Revenue for 1886-87.

Canals and Districts.		Water share of net Consolidated Revenue as in Table VII.	Deduct average before improvement.	Balance Irrigation share due to Canals.	Direct Receipts, Hakába and Miscellaneous.	Difference of Assessment on Jághir Land.	Total Direct and Indirect Receipts.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals ...	Desert Canal	65,311	...	65,311	37,348	29,723	1,32,382
	Unharwah	43,773	...	43,773	32	...	43,805
	Begári Canal	2,51,196	24,856	2,26,340	45,443	40,791	3,12,574
	Kashmor Bund	9,652	...	9,652	...	...	9,652
Shikárpur Canals ...	Canals in Rohri	1,62,327	...	1,62,327	3,803	13,883	1,80,013
	Bunds in Rohri	.....	...	.....	1	...	1
	Sind Canal	1,46,036	...	1,46,036	2,134	14,066	1,62,236
	Sukkur-Begári Bund ...	.....	...	.....	149	...	149
Ghár Canals	Sukkur Canal	1,61,967	71,550	90,417	1,721	3,767	95,905
	Ghár	4,79,818	1,16,832	3,62,986	5,222	13,229	3,81,437
	Nára	3,70,959	...	3,70,959	5,675	22,417	3,99,051
	Wáhur	16,671	...	16,671	494	...	17,165
	Marvi	10,021	...	10,021	1,679	...	11,700
	Bunds, right bank	147	...	147	98	119	364
Eastern Nára Canals.	Nára Supply Channel ...	4,334	...	4,334	5,052	3,868	13,254
	Eastern Nára	26,704	3,444	23,260	10,777	...	34,037
	Mithrau Canal	1,74,587	...	1,74,587	894	...	1,75,481
	Thar Canal	45,918	...	45,918	992	3,233	50,143
	Dimwah	3,832	...	3,832	2	...	3,834
	Heranwah	1,175	...	1,175	...	...	1,175
Hyderabad Canals ...	Mehrabwah	21,110	...	21,110	84	...	21,194
	Nasrat	41,876	...	41,876	517	1,483	43,876
	Naolakhi	1,01,022	...	1,01,022	1,448	5,432	1,07,902
	Dámbro	14,597	...	14,597	128	883	15,608
	Dad	43,011	...	43,011	2,467	9,966	55,444
	Rein	35,834	...	35,834	332	61	36,227
	Alibhar Kacheri	13,298	8,427	4,871	479	2,397	7,747
	Márak	80,656	36,459	44,197	2,511	12,205	58,913
	Gháro Mahmuda	86,741	...	86,741	7,926	24,018	1,18,685
	Kari Shúmali	37,805	...	37,805	3,906	9,198	50,909
	Nasir	43,401	...	43,401	1,890	3,546	48,837
	Sarfraz	28,598	11,155	17,443	1,461	7,953	26,857
	Other Canals	52,103	...	52,103	1,041	3,708	56,852
Fuleli Canals... ...	Fuleli	4,36,882	1,30,284	3,06,598	27,415	1,01,012	4,35,025
	Other Canals...	37,300	...	37,300	699	2,406	40,405
Karáchi Canals ...	Nára	1,62,905	...	1,62,905	5,907	6,570	1,75,382
	Phitta	9,642	...	9,642	439	1,228	11,309
	Canals north of Kotri ...	25,581	...	25,581	561	2,472	28,614
	Kalri	20,430	...	20,430	431	814	21,675
	Baghár	29,569	...	29,569	789	2,883	33,241
	Uchita	26,452	...	26,452	37	...	26,489
	Canals in Tatta, &c. ...	17,515	...	17,515	1,596	967	20,078
	Shal Canals	6,878	...	6,878	...	...	6,878
	Pinyári	1,41,772	...	1,41,772	3,521	2,465	1,47,758
	Canals in Mirpur Batoro ...	24,409	...	24,409	4	...	24,413
	Canals in Sujáwal ...	16,410	...	16,410	11	116	16,537
	Satta	18,011	...	18,011	17	647	18,675
	Canals in Jati	3,268	...	3,268	65	480	3,813
	Khanta	9,545	...	9,545	92	698	10,335
	Kokawari	22,000	...	22,000	540	...	22,540
	Canals in Sháhbandar ...	4,124	...	4,124	241	543	4,908
	Bunds, left bank	...	...	.....	121	422	543
	Bunds, right bank	2,326	...	2,326	100	545	2,971
Begári Canals		3,69,932	24,856	3,45,076	82,823	70,514	4,98,413
Shikárpur Canals		3,08,363	...	3,08,363	6,087	27,949	3,42,399
Ghár Canals		10,39,583	1,88,382	8,51,201	14,889	39,532	9,05,622
Eastern Nára Canals		2,56,550	3,444	2,53,106	17,717	7,101	2,77,924
Hyderabad Canals		6,00,052	56,041	5,44,011	24,190	80,850	6,49,051
Fuleli Canals		4,74,182	1,30,284	3,43,898	28,114	1,03,418	4,75,430
Karáchi Canals		5,40,837	...	5,40,837	14,472	20,850	5,76,159
	Total ...	35,89,499	4,03,007	31,86,492	1,88,292	3,50,214	37,24,998
	Add—Agricultural Receipts ...				194	...	194
	Total ...				1,88,486	3,50,214	37,25,192

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE VI A.

Actual Direct and Indirect Receipts of Canal Revenue in 1886-87 as shown in the General Revenue Accounts of Executive Districts prepared by the Examiner, Public Works Accounts.

Canals and Districts.		Water Share of net Consolidated Revenue collected.	Deduct average before improvement.	Balance Irrigation Share due to Canals.	Direct Receipts – Hakába and Miscellaneous.	Difference of Assessment on Jághir Lands.	Total Direct and Indirect Receipts.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals ...	Desert Canal	67,466	.....	67,466	37,348	29,723	1,34,537
	Unharwah	44,054	.....	44,054	32	.....	44,086
	Begári Canal	2,40,547	24,856	2,15,691	45,443	40,791	3,01,925
	Kashmor Bund...	9,652	.....	9,652	.....	.....	9,652
Shikárpur Canals ...	Canals in Rohri	1,64,556	.....	1,64,556	3,803	13,883	1,82,242
	Bunds in Rohri	.....	.....	.....	1	.....	1
	Sind Canal	1,48,126	.....	1,48,126	2,134	14,066	1,64,326
	Sukkur-Begári Bund	.....	.....	.....	149	.....	149
Ghár Canals	Sukkur Canal	1,60,699	71,550	89,149	1,721	3,767	94,637
	Ghár	4,89,406	1,16,832	3,72,574	5,222	13,229	3,91,025
	Nára	3,70,966	.....	3,70,966	5,675	22,417	3,99,058
	Wáhur	16,671	.....	16,671	494	.....	17,165
	Marvi	10,021	.....	10,021	1,679	.....	11,700
	Bunds, right bank	147	.....	147	98	119	364
Eastern Nára Canals.	Nára Supply Channel	4,335	.....	4,335	5,052	3,868	13,255
	Eastern Nára	26,704	3,444	23,260	10,777	.....	34,037
	Mithrau Canal	1,75,226	.....	1,75,226	894	.....	1,76,120
	Thar Canal	46,304	.....	46,304	992	3,233	50,529
	Dimwah	3,832	.....	3,832	2	.....	3,834
	Heranwah	1,175	.....	1,175	.....	.....	1,175
Hydérabad Canals ...	Mehrabwah	21,110	.....	21,110	84	.....	21,194
	Nasrat	41,876	.....	41,876	517	1,483	43,876
	Naolakhi	1,01,022	.....	1,01,022	1,448	5,432	1,07,902
	Dámbro	14,597	.....	14,597	128	883	15,608
	Dad	43,011	.....	43,011	2,467	9,966	55,444
	Rein	35,928	.....	35,928	332	61	36,321
	Alibhar Kacheri	13,215	8,427	4,788	479	2,397	7,664
	Márak	81,745	36,459	45,286	2,511	12,205	60,002
	Gháro Mahmuda	86,663	.....	86,663	7,926	24,018	1,18,607
	Kari Shumali	38,488	.....	38,488	3,906	9,198	51,592
	Nasir	44,131	.....	44,131	1,890	3,546	49,567
	Sarfraz	29,261	11,155	18,106	1,461	7,953	27,520
	Other Canals	52,103	.....	52,103	1,041	3,708	56,852
Fuleli Canals... ...	Fuleli	4,38,688	1,30,284	3,08,404	27,415	1,01,012	4,36,831
	Other Canals	40,207	.....	40,207	699	2,406	43,312
Karáchí Canals ...	Nára	1,63,098	.....	1,63,098	5,907	6,570	1,75,575
	Phitta	9,756	.....	9,756	439	1,228	11,423
	Canals north of Kotri... ...	26,319	.....	26,319	561	2,472	29,352
	Kalri	19,792	.....	19,792	431	814	21,037
	Baghár	29,646	.....	29,646	789	2,883	33,318
	Uchita	27,553	.....	27,553	37	.....	27,590
	Canals in Tatta, &c.	17,406	.....	17,406	1,596	967	19,969
	Shal Canals	6,737	.....	6,737	.....	.....	6,737
	Pinyári	1,41,891	.....	1,41,891	3,521	2,465	1,47,877
	Canals in Mirpur Batoro ...	25,127	.....	25,127	4	.....	25,131
	Canals in Sujáwal	16,693	.....	16,693	11	116	16,820
	Satta	18,738	.....	18,738	17	647	19,402
	Canals in Jati	3,298	.....	3,298	65	480	3,843
	Khanta	10,843	.....	10,843	92	698	11,633
	Kokawari	24,133	.....	24,133	540	... ..	24,673
	Canals in Shábbandar... ...	4,309	.....	4,309	241	543	5,093
	Bunds, left bank	.....	.....	.....	121	422	543
	Bunds, right bank	2,358	.....	2,358	100	545	3,003
Begári Canals		3,61,719	24,856	3,36,863	82,823	70,514	4,90,200
Shikárpur Canals		3,12,682	.....	3,12,682	6,087	27,949	3,46,718
Ghár Canals		10,47,910	1,88,382	8,59,528	14,889	39,532	9,13,949
Eastern Nára Canals		2,57,576	3,444	2,54,132	17,717	7,101	2,78,950
Hyderabad Canals		6,03,150	56,041	5,47,109	24,190	80,850	6,52,149
Fuleli Canals		4,78,895	1,30,284	3,48,611	28,114	1,03,418	4,80,143
Karáchi Canals		5,47,697	.....	5,47,697	14,472	20,850	5,83,019
	Total ...	36,09,629	4,03,007	32,06,622	1,88,292	3,50,214	37,45,128
	Add Agricultural Receipts ...				194	.....	194
	Total ...				1,88,486	3,50,214	37,45,322

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE VII.

Area of Cultivation and Consolidated Revenue for 1886-87.

	Canals and Districts.	Cultivation.			Consolidated Revenue.			Remissions.			Net Consolidated Revenue.	Land Share, 10 per cent.	Water Share, 90 per cent.
		Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif	Rabi.	Total.			
		Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals.	Desert Canal	37,131	2,437	39,568	74,569	4,805	79,374	6,452	354	6,806	72,568	7,257	65,311
	Unharwah	21,869	2,453	24,322	43,811	4,941	48,752	...	115	115	48,637	4,864	43,773
	Begári Canal	131,233	3,833	135,066	2,82,506	10,015	2,92,521	11,275	2,139	13,414	2,79,107	27,911	2,51,196
	Kashmor Bund	1,286	3,983	5,269	2,615	8,109	10,724	...	...	...	10,724	1,072	9,652
Shikárpur Canals.	Canals in Rohri... ...	48,349	17,249	65,598	1,29,560	51,471	1,81,031	668	...	668	1,80,363	18,036	1,62,327
	Bunds in Rohri	...	...	...	...	...	...	...	...	...	...	...	...
	Sind Canal ...	48,095	4,930	53,025	1,45,117	17,145	1,62,262	...	...	...	1,62,262	16,226	1,46,036
	Sukkur-Begári Bund ...	...	...	...	...	...	...	...	...	...	...	...	...
Ghár Canals.	Sukkur Canal	55,929	10,275	66,204	1,47,369	32,594	1,79,963	...	...	...	1,79,963	17,996	1,61,967
	Ghár	163,674	6,626	170,300	5,99,112	24,259	6,23,371	89,791	449	90,240	5,33,131	53,313	4,79,818
	Nára	109,485	14,183	123,668	3,62,105	52,109	4,14,214	2,037	...	2,037	4,12,177	41,218	3,70,959
	Wáhur	6,414	522	6,936	16,844	1,679	18,523	...	...	...	18,523	1,852	16,671
	Marvi	2,680	1,136	3,816	6,907	4,227	11,134	...	...	...	11,134	1,113	10,021
	Bunds, right bank ...	51	36	87	95	69	164	...	...	...	164	17	147
Eastern Nára Canals	Nára Supply Channel ...	390	1,293	1,683	1,252	3,564	4,816	...	...	..	4,816	482	4,334
	Eastern Nára	11,683	6,755	18,438	18,015	11,656	29,671	...	...	...	29,671	2,967	26,704
	Mithrau Canal	68,647	19,060	87,707	1,59,489	34,539	1,94,028	...	43	43	1,93,985	19,398	1,74,587
	Thar Canal	19,275	3,114	22,389	45,558	5,462	51,020	...	...	...	51,020	5,102	45,918
	Dimwah	1,881	388	2,269	3,567	690	4,257	...	...	...	4,257	425	3,832
	Heranwah	610	93	703	1,123	183	1,306	...	...	...	1,306	131	1,175
Hyderabad Canals.	Mehrabwah	10,863	995	11,858	22,766	838	23,604	119	30	149	23,455	2,345	21,110
	Nasrat	15,480	2,127	17,607	40,908	6,338	47,246	717	...	717	26,529	4,653	41,876
	Naolakhi	42,408	3,610	46,018	1,04,352	8,072	1,12,424	177	...	177	1,12,247	11,225	1,01,022
	Dámbro	6,349	523	6,872	14,853	1,366	16,219	...	...	...	16,219	1,622	14,597
	Dad	16,975	3,662	20,637	38,144	9,646	47,790	...	...	...	47,790	4,779	43,011
	Rein	16,822	2,371	19,193	35,189	4,955	40,144	328	...	328	39,816	3,982	35,834
	Alibhar Kacheri ...	6,341	137	6,478	14,490	286	14,776	...	...	...	14,776	1,478	13,298
	Márak	35,675	620	36,295	88,507	1,111	89,618	...	...	...	89,618	8,962	80,656
	Gharo Mahmuda ...	43,233	2,882	46,115	90,531	6,132	96,663	225	59	284	96,379	9,638	86,741
	Kari Shumáli	27,849	456	28,305	41,621	1,245	42,866	861	...	861	42,005	4,200	37,805
	Nasir	24,908	822	25,730	47,017	1,935	48,952	729	...	729	48,223	4,822	43,401
	Sarfraz	18,674	767	19,441	29,716	2,059	31,775	...	...	...	31,775	3,177	28,598
	Other Canals	20,500	4,523	25,023	47,116	10,949	58,065	173	...	173	57,892	5,789	52,103
Fuleli Canals.	Fuleli	181,988	17,169	199,157	4,48,594	37,538	4,86,132	615	92	707	4,85,425	48,543	4,36,882
	Other Canals	14,385	724	15,109	39,487	1,957	41,444	...	...	...	41,444	4,144	37,300
Karáchi Canals.	Nára	42,148	30,220	72,368	1,07,541	77,302	1,84,843	3,043	794	3,837	1,81,006	18,101	1,62,905
	Phitta	3,422	1,450	4,872	7,156	3,589	10,745	32	...	32	10,713	1,071	9,642
	Canals north of Kotri ...	11,296	2,089	13,385	24,612	4,845	29,457	956	78	1,034	28,423	2,842	25,581
	Kalri	8,132	990	9,122	21,079	3,301	24,380	1,680	...	1,680	22,700	2,270	20,430
	Baghár	13,730	3,555	17,285	26,982	7,419	34,401	1,547	...	1,547	32,854	3,285	29,569
	Uchita	9,732	1,010	10,742	30,255	1,711	31,966	2,347	228	2,575	29,391	2,939	26,452
	Canals in Tatta, &c. ...	8,361	1,141	9,502	18,839	3,421	22,260	2,517	282	2,799	19,461	1,946	17,515
	Shal Canals	2,305	509	2,814	6,679	1,245	7,924	...	282	282	7,642	764	6,878
	Pinyári	54,936	2,201	57,137	1,49,440	8,282	1,57,722	20	178	198	1,57,524	15,752	1,41,772
	Canals in Mirpur Batoro.	9,268	800	10,068	27,317	1,178	28,495	1,296	78	1,374	27,121	2,712	24,409
	Canals in Sujáwal ..	5,958	1,070	7,028	16,108	2,234	18,342	109	...	109	18,233	1,823	16,410
	Satta	6,896	145	7,041	18,835	1,177	20,012	...	...	...	20,012	2,001	18,011
	Canals in Jati	982	306	1,288	3,140	491	3,631	...	...	...	3,631	363	3,268
	Khanta	4,908	92	5,000	10,120	698	10,818	212	...	212	10,606	1,061	9,545
	Kokawari	11,355	442	11,797	26,162	1,432	27,594	2,998	152	3,150	24,444	2,444	22,000
	Canals in Shahbandar ...	2,476	65	2,541	3,991	733	4,724	138	4	142	4,582	458	4,124
	Bunds, left bank ...	...	...	...	...	...	...	...	...	...	...	...	...
	Bunds, right bank ...	741	49	790	2,325	260	2,585	...	...	...	2,585	259	2,326
	Begári Canals	191,519	12,706	204,225	4,03,501	27,870	4,31,371	17,727	2,608	20,335	4,11,036	41,104	3,69,932
	Shikárpur Canals	96,444	22,179	118,623	2,74,677	68,616	3,43,293	668	...	668	3,42,625	34,262	3,08,363
	Ghár Canals	338,233	32,778	371,011	11,32,432	1,14,937	12,47,369	91,828	449	92,277	11,55,092	1,15,509	10,39,583
	Eastern Nára Canals	102,486	30,703	133,189	2,29,004	56,094	2,85,098	...	43	43	2,85,055	28,505	2,56,550
	Hyderabad Canals	286,077	23,495	309,572	6,15,210	54,932	6,70,142	3,329	89	3,418	6,66,724	66,672	6,00,052
	Fuleli Canals	196,373	17,893	214,266	4,88,081	39,495	5,27,576	615	92	707	5,26,869	52,687	4,74,182
	Karáchi Canals...	196,646	46,134	242,780	5,00,581	1,19,318	6,19,899	16,895	2,076	18,971	6,00,928	60,091	5,40,837
	Total ...	1,407,778	185,888	1,593,666	36,43,486	4,81,262	41,24,748	1,31,062	5,357	1,36,419	39,88,329	3,98,830	35,89,499

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE VIII.

Discharges of certain Canals, Areas of Crops of different kinds irrigated, and Duty of Water per cubic foot of supply for Kharif Season 1886.

Canals and Executive Charges.			Average Discharge per cubic foot per second.	Areas of Land irrigated.				Area of Land irrigated.		Total Area irrigated.	Area irrigated per cubic foot of supply.
				Jowári.	Bájri.	Rice.	Other Crops.	By Lift.	By Flow.		
				Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
Frontier Upper Sind ...	Begári Canals ...	Desert Canal ...	1,311	54,588	3,272	180	9,284	...	...	70,510	53·78
		Muradwah ...	286	2,847	1,501	377	1,467	...	...	7,577	26·49
		Unharwah ...	640	15,012	2,829	166	3,862	...	...	24,322	38·00
		Begári Canal ...	3,189	105,982	2,525	11,852	46,521	...	...	177,377	55·62
Shikárpur Collectorate ...	Shikárpur Canals	Sind Canal ...	1,874	18,755	111	25,754	3,422	...	...	48,042	25·63
	Ghár Canals ...	Sukkur Canal ...	2,028	14,729	178	30,080	10,935	...	...	56,933	28·07
		Ghár Canal ...	4,282	28,230	1,201	128,889	5,361	...	...	168,017	39·24
Thar and Párkar ...	Eastern Nára ...	Mithrau ...	2,183	327	10,725	50,321	8,005	58,944	10,434	69,378	31·78
Hyderabad Collectorate ...	Hyderabad Canals ...	Mehrabwah ...	528	8,032	1,951	29	851	10,209	654	10,863	20·58
		Nasrat	487	12,610	1,311	66	2,009	11,449	4,547	15,996	32·85
		Naolakhi... ...	1,342	29,082	4,653	594	10,626	34,457	10,498	44,955	33·50
		Márak	1,432	4,288	23,106	59	15,165	41,673	945	42,618	29·76
		Ghalu	1,010	1,146	22,356	2	13,240	36,481	263	36,744	36·38
		Nasir	700	723	16,295	5	9,955	26,972	6	26,978	38·54
		Sarfraz	512	765	16,292	18	6,172	23,009	238	23,247	45·41
	Fuleli Canals ...	Fuleli	5,875	1,097	40,677	147,282	14,761	51,503	152,314	203,817	34·69
		Imamwah ...	210	65	4,595	3,892	1,178	5,652	4,078	9,730	46·33
		Sanhi Guni ...	205	10	308	8,262	1,204	252	9,532	9,784	47·24
		Sherwah	136	6	66	2,621	51	55	2,689	2,744	20·18
		Aliwah	125	1	...	2,518	14	3	2,530	2,533	20·26

Note.—During the kharif season lands on the Desert Canal, Muradwah, Unharwah, and Begári Canal were flooded for rabi cultivation to the extent of 3,182, 1,385, 2,453 and 4,902 acres respectively, so that the duty noted against them is for these areas also.

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE IX.

Rainfall in the Province of Sind for 1886-87.

Collectorates and Tálukas.			April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Total.
			In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.
Upper Sind Frontier.	Begári Canals.	Kashmor...	...	...	...	1 94	...	...	...	0 58	...	0 26	0 3	...	2 81
		Thul ...	...	...	...	1 95	...	...	...	...	...	...	...	...	1 95
		Jacobabad	...	...	...	1 65	...	...	...	0 2	...	0 52	0 7	...	2 26
		Shahdádpur	...	...	...	0 50	...	...	...	...	...	0 75	...	...	1 25
Shikárpur Canals.	Shikárpur Canals.	Ubauro ...	...	0 5	...	0 51	...	...	...	...	...	0 12	...	...	0 68
		Mirpur ...	...	...	...	3 52	..	...	...	0 19	...	...	...	...	3 71
		Ghotki ...	...	...	...	1 60	...	...	...	0 52	...	0 21	0 6	...	2 39
		Rohri ...	...	...	0 5	1 30	...	...	...	0 37	...	0 36	0 20	...	2 28
		Shikárpur	...	0 15	...	1 17	...	...	...	0 16	...	0 46	0 6	...	2 0
		Sukkur ...	...	...	0 1	0 75	...	...	...	0 43	...	0 40	0 9	...	1 68
		Garhi Yásin	...	...	...	0 66	...	..	...	0 6	...	0 53	0 4	...	1 29
	Ghár Canals.	Rato-dero	...	...	...	...	...	...	...	...	...	0 59	0 3	...	0 62
		Lárkhána	...	...	...	0 4	...	...	...	0 2	...	0 49	0 9	...	0 64
		Kambar ...	...	...	...	0 75	...	...	...	...	...	0 61	...	...	1 36
		Bákráni ...	...	...	...	0 21	...	...	...	0 2	...	0 23	0 9	...	0 55
		Mehar ...	...	0 8	...	0 68	...	...	...	...	...	0 33	0 5	...	1 14
		Wárah ...	...	...	...	0 49	0 8	...	...	...	...	0 32	0 15	...	1 4
		Khairpur Náthe-sháh ...	...	0 15	...	0 55	...	...	...	...	...	0 42	0 7	...	1 19
Thar and Párkar.	Eastern Nára Canals.	Khipra ...	...	...	...	3 28	0 30	...	...	0 19	...	0 55	...	...	4 32
		Umarkot ...	...	...	...	7 21	1 54	0 20	...	...	...	0 54	...	...	9 49
		Mitti ...	...	1 46	4 45	3 58	1 98	...	...	...	...	0 7	...	...	11 54
		Nagar ...	...	...	6 67	10 73	2 87	...	...	...	...	...	...	...	20 27
Hyderabad Collectorate.	Hyderabad Canals.	Kandiáro ...	0 7	...	...	1 30	...	...	...	0 12	...	0 30	...	...	1 79
		Nausháhro ...	0 5	...	...	1 92	...	...	...	0 16	...	0 78	...	...	2 91
		Tháru Sháh ...	...	...	...	2 20	...	...	...	0 15	...	0 93	...	...	3 28
		Moro	...	0 8	...	1 35	0 10	...	...	...	...	0 86	...	...	2 39
		Sákrand...	0 2	0 23	...	2 47	0 70	...	...	3 27	...	0 90	...	...	7 59
		Hála	...	...	...	4 90	0 50	...	...	2 3	...	1 42	...	...	8 85
		Shahdádpur ...	0 27	...	...	1 52	0 38	...	...	3 20	...	1 7	...	...	6 44
		Tando Adam ...	...	...	...	3 17	0 46	...	...	1 2	...	1 0	...	...	5 65
		Tando Alahyar...	...	...	...	3 27	0 42	...	...	0 18	...	0 44	...	...	4 31
		Mirpur Khás ...	...	...	0 2	4 70	0 20	...	...	...	...	0 54	...	...	5 46
	Fuleli Canals.	Hyderabad ...	0 18	0 13	...	3 21	0 84	...	...	0 53	...	1 9	...	...	5 98
		Dero Mohbat ...	...	...	...	2 84	1 40	...	...	0 26	...	0 53	...	...	5 03
		Tando Bágo ...	...	...	...	3 90	0 31	...	...	...	...	0 82	...	...	5 03
		Badin	...	...	...	5 90	1 20	...	...	...	...	1 0	...	...	8 10
		TandoMuhammad Khán ...	0 5	...	...	2 33	1 18	..	...	0 31	...	0 73	...	...	4 60
Karáchi Collectorate.	Karáchi Canals.	Dádú	...	0 8	...	0 47	...	...	...	0 12	...	1 9	...	...	1 76
		Johi	...	...	...	2 29	...	...	...	0 11	...	1 18	...	...	3 58
		Sehwan	...	0 5	...	3 5	0 10	...	...	0 13	...	1 0	...	...	4 33
		Mánjhand ...	...	...	...	0 88	0 30	...	...	1 73	...	1 13	...	...	4 4
		Kotri	...	0 29	...	3 47	0 95	...	...	0 50	...	2 40	...	...	7 61
		Bula Khán ...	...	...	...	5 80	0 60	...	...	0 85	...	1 40	...	...	8 65
		Jerruck	...	...	...	1 59	0 41	...	...	0 15	...	0 78	...	...	2 93
		Tatta	...	...	...	6 94	0 21	...	...	0 14	...	0 85	...	...	8 14
		Sákro	...	...	...	5 75	...	...	...	0 10	...	1 35	...	...	7 20
		Mirpur Batoro ..	...	...	...	5 30	0 10	...	...	...	...	0 70	...	...	6 10
		Sujáwal	...	...	...	8 57	0 28	...	...	...	...	0 72	...	...	9 57
		Sháhbandar ..	...	...	...	7 47	0 6	0 1	...	0 10	...	0 73	...	...	8 37
		Kotri Ghorábári .	...	...	...	3 46	...	...	...	...	...	0 62	...	...	4 8
		Keti	...	..	0 8	13 40	0 17	...	...	0 30	...	1 95	...	...	15 90
		Mugalbin ...	...	...	...	7 2	0 70	...	...	...	...	0 40	...	...	8 12
		Karáchi	...	...	...	9 78	0 3	0 4	...	0 44	...	1 56	...	...	11 85

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

General Abstract of Financial Results of Irrigation Works

	WORKS IN									
	MAJOR WORKS—PRODUCTIVE WORKS.					MINOR WORKS AND NAVIGATION—WORKS FOR WHICH CAPITAL				
	Desert Canal.	Unharwah.	Begári Canal.	Eastern Nára Works.	Total.	Sukkur Canal.	Ghár Canal.	Mehrabwah.	Alibhar Kacheri Canal.	Márak Great Canal.
	Rs.	Rs	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Capital Outlay.										
During year ... Direct ...	34,408	25,908	18,607	1,55,921	2,34,844	...	.....	...	...	...
During year ... Indirect ...	756	569	262	4,206	5,793	...	.....	...	...	...
Total ...	35,164	26,477	18,869	1,60,127	2,40,637	...	.....	...	...	...
To end of year ... Direct ...	11,19,625	3,21,398	16,19,520	47,86,848	78,47,391	13,28,747	4,15,537	66,018	23,207	1,93,600
To end of year ... Indirect ...	38,217	7,046	47,326	1,77,257	2,69,846	59,966	25,440	1,851	710	7,953
Total ...	11,57,842	3,28,444	16,66,846	49,64,105	81,17,237	13,88,713	4,40,977	67,869	23,917	2,01,553
Gross Revenue.										
During year ... Direct ...	37,348	32	45,443	17,717	1,00,540	1,721	5,222	84	479	2,511
During year ... Indirect ...	67,466	44,054	2,15,691	2,54,132	5,81,343	89,149	3,72,574	21,110	4,788	45,286
Total ...	1,04,814	44,086	2,61,134	2,71,849	6,81,883	90,870	3,77,796	21,194	5,267	47,797
To end of year ... Direct ...	1,30,925	32	2,15,322	5,26,977	8,73,256	11,932	1,80,857	516	9,615	43,759
To end of year ... Indirect ...	12,55,710	64,923	32,84,655	40,08,127	86,13,415	7,30,334	1,06,44,097	79,982	85,849	6,51,963
Total ...	13,86,635	64,955	34,99,977	45,35,104	94,86,671	7,42,266	1,08,24,954	80,498	95,464	6,95,722
Working Expenses.										
During year ... Direct ...	47,496	15,582	74,902	91,036	2,29,016	29,801	1,65,535	15,020	5,774	15,863
During year ... Indirect ...	1,419	353	1,786	3,202	6,760	643	4,056	400	162	344
Total ...	48,915	15,935	76,688	94,238	2,35,776	30,444	1,69,591	15,420	5,936	16,207
To end of year ... Direct ...	3,88,686	25,223	17,08,430	22,41,036	43,63,375	7,46,420	29,55,054	53,883	88,843	2,33,738
To end of year ... Indirect ...	11,530	582	46,616	1,01,024	1,59,752	22,891	67,475	1,303	2,717	6,018
Total ...	4,00,216	25,805	17,55,046	23,42,060	45,23,127	7,69,311	30,22,529	55,186	91,560	2,39,756
Net Revenue.										
During year	55,899	28,151	1,84,446	1,77,611	4,46,107	60,426	2,08,205	5,774	—669	31,590
To end of year	9,86,419	39,150	17,44,931	21,93,044	49,63,544	—27,045	78,02,425	25,312	3,904	4,55,966
Simple Interest.										
During year	44,097	12,338	64,409	1,88,355	3,09,199	...	.....	...	...	...
To end of year	4,16,695	25,423	8,90,243	30,95,216	44,27,577	...	.....	...	...	...
Net profit after paying off Interest.										
During year	11,802	15,813	1,20,037	—10,744	1,36,908	...	.....	...	...	...
To end of year	5,69,724	13,727	8,54,688	—9,02,17	5,35,967	...	.....	...	...	...

Notes.—

(1) Direct outlay under Working Expenses includes share of cost of collection in the Civil Department.

(2) Interest charges on account of Productive Public Works to end of 1885-86 are revised at 4 per cent, *vide* Government of India Resolution No. 159 A. G., dated 8th July 1887, communicated in Government Resolution No. 1172, dated 28th idem.

(3) Do. of works other than Productive Public Works are not shown, *vide* Government of India Circulars No IV., P. W., dated 1st May 1884, communicated in Government Resolution No. 223, dated 23rd idem.

in Sind for and up to the close of 1886-87.

OPERATION.												
AND REVENUE ACCOUNTS ARE KEPT.			Grand Total.	MINOR WORKS AND NAVIGATION—WORKS FOR WHICH ONLY REVENUE ACCOUNTS ARE KEPT.						Expenditure on and Receipts from Agricultural Works for which neither Capital nor Revenue Accounts are kept.		
Surfrazwah.	Fuleli Canal.	Total.		Under Executive Engineer, Shikárpur Canals.	Under Executive Engineer, Ghár Canals.	Under Executive Engineer, Hyderabad Canals.	Under Executive Engineer, Fuleli Canals.	Under Executive Engineer, Karáchi Canals.	Total.		Expenditure.	Receipts.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.
...	...	...	2,34,844	...	...	...	...	...	...			
...	...	...	5,793	...	...	...	...	...	...	*Begári Canals.*		
										Kashmor Bund.		
..	...	...	2,40,637	...	...	...	...	...	...	Maintenance and repairs to the bund	31,789	
										Maintenance of garden at Badani	473	
1,18,559	9,30,232	30,75,900	1,09,23,291	...	...	...	...	...	...	Rent of Telegraph line at Badani	1,800	
6,121	33,243	1,35,284	4,05,130	...	...	...	...	...	...	Maintenance and repairs Buxaliwah	335	
										Loop bund near Kashmor	1,01,395	
1,24,680	9,63,475	32,11,184	1,13,28,421	...	...	...	...	...	...	Small length of bund near Dari	4,952	
										Estimate for construction of a forest channel and sluice for Alipur Belo	39	
1,461	27,415	38,893	1,39,433	6,087	7,946	19,655	699	14,472	48,859			
18,106	3,08,404	8,59,417	14,40,760	3,12,682	3,97,805	4,57,819	40,207	5,47,697	17,56,210	General charges for Establishment and Tools and Plant	26,350	
										Share of collection charges in the Civil Department	965	
19,567	3,35,819	8,98,310	15,80,193	3,18,769	4,05,751	4,77,474	40,906	5,62,169	18,05,069			
25,385	5,11,369	7,83,433	16,56,689	...	...	...	...	...	...		1,68,098	164
1,57,417	46,33,531	1,69,83,173	2,55,96,588	...	...	...	...	...	...	Irrigation share of Land Revenue	...	9,652
1,82,802	51,44,900	1,77,66,606	2,72,53,277	...	...	...	...	...	...			
										Total, Begári Canals ...	1,68,098	9,816
15,567	1,81,558	4,29,118	6,58,134	1,79,373	1,26,015	1,80,940	32,816	3,28,486	8,47,630			
423	5,357	11,385	18,145	...	...	...	...	...	...	*Shikárpur Canals.*		
15,990	1,86,915	4,40,503	6,76,279	1,79,373	1,26,015	1,80,940	32,816	3,28,486	8,47,630	Sluice in Kásimpur Bund for Ding Forest ...	674	
										Do. Koraiwah for Budh Forest	595	
1,65,633	36,85,191	79,28,762	1,22,92,137	...	...	...	...	...	...	Kásimpur Bund	2,937	
6,244	1,15,743	2,22,391	3,82,143	..	...	...	..	...	...	General charges for Establishment and Tools and Plant	1,048	
1,71,877	38,00,934	81,51,153	1,26,74,280	...	...	...	...	...	...			
										Total Shikárpur Canals...	5,254	7
3,577	1,48,904	4,57,807	9,03,914	1,39,396	2,79,736	2,96,534	8,090	2,33,683	9,57,439			
10,925	13,43,966	96,15,453	1,45,78,997	...	...	...	...	...	...	*Ghar Canals*	...	18
										Eastern Nára District ...	...	5
										Mathematical Instrument Depôt in Sind	392	...
...	...	...	...	...	...	...	...	...	...			
...	...	...	...	...	...	...	...	...	...	Total ...	1,73,744	9,846
..	...	...	...	..	...	...	...	...	...			
...	...	...	...	...	...	...	...	...	...			

W. I. LEBRETON, Major,
Examiner of Public Works Accounts.

Memo. showing the amount of loss to Canals on account of difference between assessments of Water-rates on Jághir lands and the assessments at the ordinary rates in force for Government lands.

	To end of 1885-86.	During 1886-87.	To end of 1886-87.	Remarks.
	Rs.	Rs.	Rs.	
Major Works—Productive Works.				
Desert Canal	(*a*) 90,344	29,723	1,20,067	(*a*) Rs. 23,442 deducted on account of remissions in Khelat territory for previous years granted in 1886-87.
Begári Canal	(*b*)1,73,454	40,791	2,14,245	(*b*) Rs. 26,809 do. do.
Eastern Nára Works	10,420	7,101	17,521	
Total ...	2,74,218	77,615	3,51,833	
Minor Works and Navigation—Works for which Capital and Revenue accounts are kept.				
Sukkur Canal	11,476	3,767	15,243	
Ghár Canal	74,241	13,229	87,470	
Mehrabwah	317	...	317	
Alibhar Kacheri Canal	14,520	2,397	16,917	
Marak Great Canal	77,272	12,205	89,477	
Surfrazwah	29,929	7,953	37,882	
Fuleli Canal	6,27,690	1,01,012	7,28,702	
Total works for which Capital and Revenue accounts are kept ...	8,35,445	1,40,563	9,76,008	
Works for which only Revenue accounts are kept.				
Under Executive Engineer, Shikárpur Canals.	...	27,949	...	
Do. Ghár do.	...	22,536	...	
Do. Hyderabad do.	...	58,295	...	
Do. Fuleli do.	...	2,406	...	
Do. Karáchi do.	...	20,850	...	
Total works for which only Revenue accounts are kept ...	...	1,32,036	...	

W. I. LeBRETON, Major,
Examiner of Public Works Accounts.

STATEMENT No. I B.

Capital Account of Irrigation Works in Sind for and to end of 1886-87.

Name of Work.	During the Year.										To end of the Year.									
	Direct Charges.						Indirect Charges.			Grand Total.	Direct Charges.						Indirect Charges.			Grand Total.
	Works.	Establishment.	Tools and Plant.	Total.	Deduct Receipts on Capital Account.	Total.	Capitalization.	Leave and Pension Allowances.	Total.		Works.	Establishment.	Tools and Plant.	Total.	Deduct Receipts on Capital Account.	Total.	Capitalization.	Leave and Pension Allowances.	Total.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MAJOR WORKS.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
PRODUCTIVE WORKS.																				
In Operation.																				
Desert Canal	29,010	5,398	...	34,408	...	34,408	...	756	756	35,164	9,01,872	2,03,510	14,280	11,19,662	37	11,19,625	...	38,217	38,217	11,57,842
Unharwah	21,844	4,064	...	25,908	...	25,908	...	569	569	26,477	2,70,594	50,323	481	3,21,398	...	3,21,398	...	7,046	7,046	3,28,444
Begári Canal	16,735	1,872	...	18,607	...	18,607	...	262	262	18,869	13,86,009	2,28,864	4,666	16,19,539	19	16,19,520	4,246	43,080	47,326	16,66,846
Eastern Nára Works ...	1,25,318	30,045	558	1,55,921	...	1,55,921	...	4,206	4,206	1,60,127	38,14,268	9,32,113	40,643	47,87,024	176	47,86,848	2,669	1,74,588	1,77,257	49,64,105
Total Major Works ...	1,92,907	41,379	558	2,34,844	...	2,34,844	...	5,793	5,793	2,40,637	63,72,743	14,14,810	60,070	78,47,623	232	78,47,391	6,915	2,62,931	2,69,846	81,17,237
MINOR WORKS AND NAVIGATION.																				
Sukkur Canal	...	..	...	...	...	...	...	...	...	...	11,10,106	2,05,471	13,330	13,28,907	160	13,28,747	19,775	40,191	59,966	13,88,713
Ghár Canal	...	..	..	...	...	...	...	...	...	...	3,38,237	75,554	1,746	4,15,537	...	4,15,537	10,329	15,111	25,440	4,40,977
Mehrabwah	..	...	...	...	...	...	...	...	...	...	52,797	13,199	22	66,018	...	66,018	...	1,851	1,851	67,869
Alibhar Kacheri Canal ...	...	...	...	..	...	...	...	...	...	...	19,636	3,548	23	23,207	...	23,207	.	710	710	23,917
Marak Great Canal ...	...	...	...	...	...	...	...	...	..	...	1,59,516	32,719	1,445	1,93,680	80	1,93,600	1,409	6,544	7,953	2,01,553
Surfrazwah	...	...	...	...	...	...	...	...	...	...	1,03,432	15,097	30	1,18,559	...	1,18,559	3,102	3,019	6,121	1,24,680
Fuleli Canal	...	...	...	..	...	...	...	...	...	...	7,71,688	1,57,914	651	9,30,253	21	9,30,232	1,664	31,579	33,243	9,63,475
Total Minor Works ...	...	..	...	...	...	...	...	...	...	...	25,55,412	5,03,502	17,247	30,76,161	261	30,75,900	36,279	99,005	1,35,284	32,11,184
Grand Total ...	1,92,907	41,379	558	2,34,844	...	2,34,844	...	5,793	5,793	2,40,637	89,28,155	19,18,312	77,317	1,09,23,784	493	1,09,23,291	43,194	3,61,936	4,05,130	1,13,28,421

W. I. LEBRETON, Major,
Examiner of Public Works Accounts.

STATEMENT No. I c.

Statement showing Financial Results of Irrigation Works in Sind for the year ending 31st March 1887.

Realizations under main heads of Revenue and Working Expenses.

Irrigation Works.	Revenue (actual Receipts).										Working Expenses.																Net Revenue.
	Irrigation.			Navigation.	Plantations.	Water-power.	Miscellaneous.	Total.	Refunds of Revenue.	Gross Revenue less Refunds.	Revenue Management.					Maintenance of Works.									Indirect Charges.	Grand Total, Working Expenses.	
											Establishment.				Total Revenue Management.	Establishment.				Works.	Repairs.	Sundries.	Tools and Plant.	Plantations.	Total Cost of Maintenance.			
	Water-rates directly paid.	Share of Land Revenue.	Total.								Direction.	Executive.	Navigation.	Civil Officers.		Direction.	Executive.	Medical.	Total.								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Major Works	Rs.	Rs.	Rs.		Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Works.																												
Desert Canal	37,138	67,466	1,04,604	..	..	..	210	1,04,814	..	1,04,814	..	1,216	..	6,747	7,963	2,818	6,103	..	8,991	..	30,461	..	151	..	39,533	1,419	48,915	55,899
Unharwah	..	44,054	44,054	..	2	..	30	44,086	..	44,086	..	..	..	4,405	4,405	796	1,723	..	2,519	..	8,602	..	56	..	11,177	353	15,935	28,151
Begári Canal	44,966	2,15,691	2,60,657	...	80	..	397	2,61,134	5	2,61,129	..	1,216	..	21,912	23,128	3,646	7,896	..	11,542	..	40,080	..	147	..	51,769	1,788	76,683	1,84,446
Eastern Nára Works	1,196	2,54,132	2,55,328	..	1,226	..	15,295	2,71,849	..	2,71,849	1,863	9,369	..	26,600	37,832	1,932	9,712	....	11,644	..	40,431	..	530	599	53,204	3,202	94,238	1,77,611
Total Major Works ..	83,300	5,81,343	6,04,643	..	1,308	..	15,932	6,81,883	5	6,81,878	1,863	11,801	..	59,664	73,328	9,192	25,434	..	34,626	..	1,19,574	..	884	599	1,55,683	6,760	2,35,771	4,46,107
Minor Works and Navigation.																												
Sukkur Canal	898	89,149	90,047	..	106	..	717	90,870	..	90,870	..	..	..	9,005	9,005	1,444	3,149	..	4,593	..	15,430	..	592	181	20,796	648	30,444	60,426
Ghár Canal	1,874	3,72,574	3,74,448	..	898	..	2,510	3,77,796	..	3,77,796	..	..	..	37,597	37,597	9,110	19,865	...	28,975	25,036	73,444	..	483	..	1,27,938	4,056	1,69,591	2,08,205
Mehrabwah	..	21,110	21,110	..	20	..	64	21,194	..	21,194	..	..	..	2,111	2,111	930	1,927	..	2,857	..	9,993	..	..	59	12,909	400	15,420	5,774
Alibhar Kacheri Canal	464	4,788	5,252	..	15	..	..	5,267	..	5,267	..	..	..	525	525	378	783	..	1,161	..	4,088	..	..	..	5,249	162	5,936	—669
Marak Great Canal	2,155	45,286	47,441	..	165	..	191	47,797	..	47,797	..	..	..	4,744	4,744	801	1,659	..	2,460	..	8,659	..	..	..	11,119	344	16,207	31,590
Surfrazwah	1,089	18,106	19,195	..	36	..	336	19,567	..	19,567	..	..	..	1,919	1,919	983	2,037	..	3,020	..	10,628	..	..	..	13,648	423	15,990	3,577
Fuleli Canal	21,605	3,08,404	3,30,009	..	1,940	..	3,870	3,35,819	..	3,35,819	..	..	..	33,029	33,029	10,154	28,115	..	38,269	..	1,09,865	..	395	..	1,48,529	5,357	1,86,915	1,48,904
Total Minor Works ..	28,085	8,59,417	8,87,502	..	3,120	..	7,688	8,98,310	..	8,98,310	..	..	..	88,930	88,930	23,800	57,535	..	81,335	25,036	2,32,107	..	1,470	240	3,40,188	11,385	4,40,503	4,57,807
Grand Total ..	1,11,385	14,40,760	15,52,145	..	4,428	..	23,620	15,80,193	5	15,80,188	1,863	11,801	..	1,48,594	1,62,258	32,992	82,969	..	1,15,961	25,036	3,51,681	..	2,354	839	4,95,871	18,145	6,76,274	9,03,914

W. I. LeBRETON, Major,
Examiner of Public Works Accounts.

STATEMENT No. II c.

Statement showing the Financial Results of Irrigation Works in Sind for the year ended 1886-87 based on actual receipts.
Principal Results of Operations for the year ended 31st March 1887.

Irrigation Works.	Direct and Indirect Capital outlay to end of 1886-87.	Gross Revenue, Direct and Indirect, from all sources.	Working Expenses, Direct and Indirect.	Net Revenue (excluding charges for Interest.)	Interest at 4 per cent. on Direct Capital outlay at commencement of year and at 2 per cent. on outlay during year.	Surplus Revenue after paying Interest on Direct Capital Outlay.		Excess charge including Interest on Direct Capital Outlay.	
						Amount.	Percentage on total sum at charge.	Amount.	Percentage on total sum at charge.
1	2	3	4	5	6	7	8	9	10
MAJOR WORKS.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Works.									
In Operation.									
Desert Canal	11,57,842	1,04,814	48,915	55,899	44,097	11,802	1·02	.....	.....
Unharwah...	3,28,444	44,086	15,935	28,151	12,338	15,813	4·81	.....	.....
Begári Canal	16,66,846	2,61,129	76,683	1,84,446	64,409	1,20,037	7·20	.....	.....
Eastern Nára Works	49,64,105	2,71,849	94,238	1,77,611	1,88,355	.....	.....	10,744	·22
Total Major Works ...	81,17,237	6,81,878	2,35,771	4,46,107	3,09,199	1,36,908	1·69	.....	.....
Minor Works and Navigation.									
In Operation.									
Sukkur Canal	13,88,713	90,870	30,444	60,426	53,150	7,276	·52	.....	.....
Ghár Canal	4,40,977	3,77,796	1,69,591	2,08,205	16,622	1,91,583	43·45	.....	.....
Mehrabwah	67,869	21,194	15,420	5,774	2,641	3,133	4·62	.....	.....
Alibhar Kacheri Canal	23,917	5,267	5,936	—669	928	.....	.....	1,597	6·68
Márak Great Canal	2,01,553	47,797	16,207	31,590	7,744	23,846	11·83	.....	.....
Surfrazwah	1,24,680	19,567	15,990	3,577	4,742	.....	.....	1,165	·93
Fuleli Canal	9,63,475	3,35,819	1,86,915	1,48,904	37,209	1,11,695	11·59	.....	.....
Total Minor Works and Navigation ...	32,11,184	8,98,310	4,40,503	4,57,807	1,23,036	3,34,771	10·43	.....	.....
Grand Total ...	1,13,28,421	15,80,188	6,76,274	9,03,914	4,32,235	4,71,679	4·16	.....	.....

W. I. LeBRETON, Major,
Examiner of Public Works Accounts.

STATEMENT No. III c.

Demands and Realizations during the year 1886-87 in Sind.

Irrigation Works.	Balance of demands unrealized at commencement of year.	Demands of the Year.				Total including balance at commencement of year.	Deduct Remissions not including cash refunds.	Net Total.	Deduct amount unrealized at close of year.	Actual receipts of the year.
		Rabi.	Kharif.	Miscellaneous Receipts.	Total.					
Major Works.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Works.										
Desert Canal	49,061	2,136	34,800	210	37,146	86,207	12,055	74,152	36,804	37,348
Unharwah...	.....	...	...	32	32	32	...	32	...	32
Begári Canal	51,780	594	32,811	477	33,882	85,662	12,887	72,775	27,332	45,443
Eastern Nára Works	139	474	892	16,521	17,887	18,026	...	18,026	309	17,717
Total Major Works ...	1,00,980	3,204	68,503	17,240	88,947	1,89,927	24,942	1,64,985	64,445	1,00,540
Minor Works and Navigation.										
Sukkur Canal	258	173	546	823	1,542	1,800	...	1,800	79	1,721
Ghár Canal	563	24	1,354	3,348	4,726	5,289	...	5,289	67	5,222
Mehrabwah	.....	...	...	84	84	84	...	84	...	84
Alibhar Kacheri Canal	665	4	437	15	456	1,121	...	1,121	642	479
Márak Great Canal	2,661	6	1,694	356	2,056	4,717	...	4,717	2,206	2,511
Surfrazwah	2,219	25	1,462	372	1,859	4,078	...	4,078	2,617	1,461
Fuleli Canal	12,671	804	18,110	5,810	24,724	37,395	...	37,395	9,980	27,415
Total Minor Works and Navigation...	19,037	1,036	23,603	10,808	35,447	54,484	...	54,484	15,591	38,893
Grand Total ...	1,20,017	4,240	92,106	28,048	1,24,394	2,44,411	24,942	2,19,469	80,036	1,39,433

W. I. LeBRETON, Major,
Examiner of Public Works Accounts.

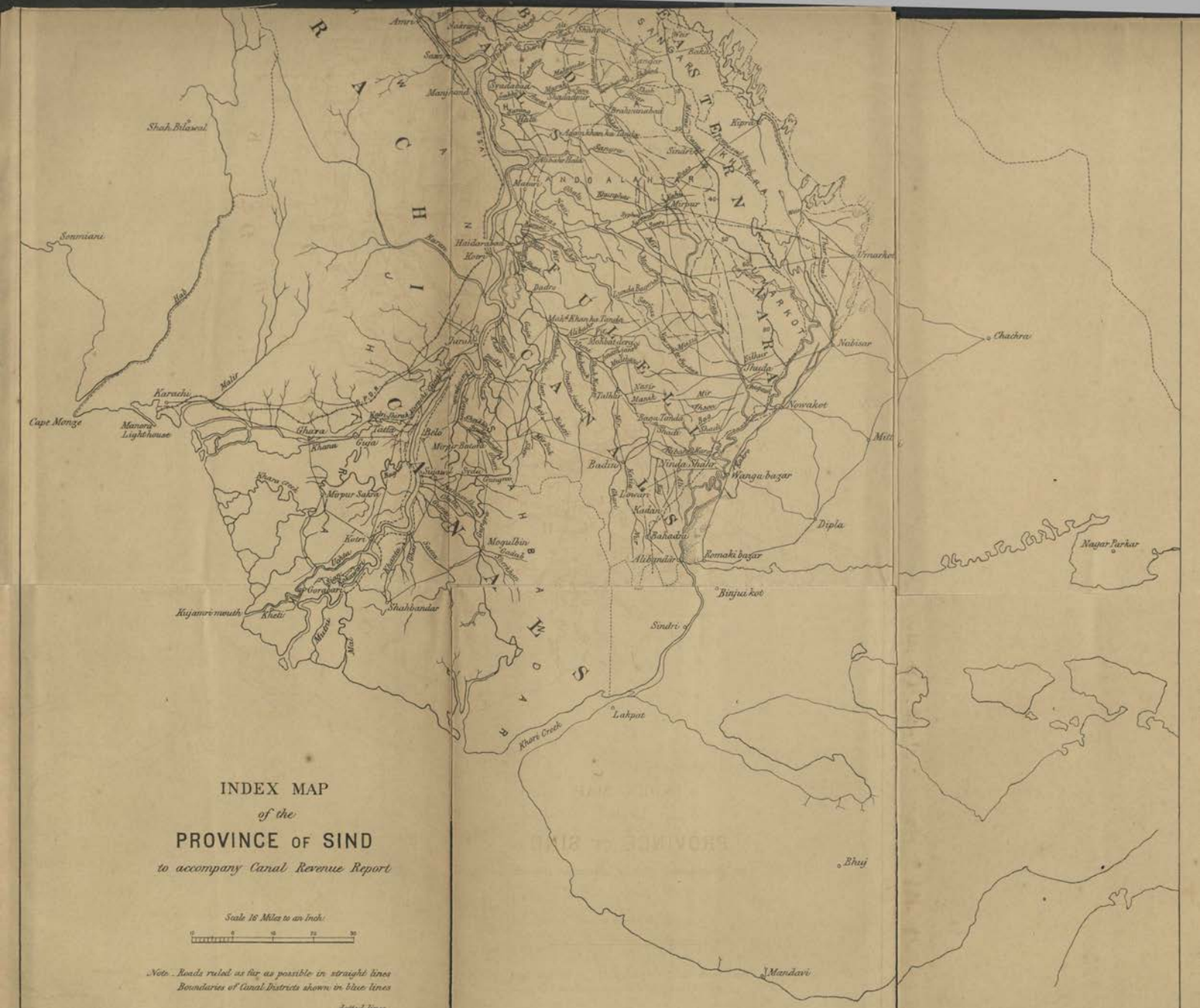
STATEMENT No. IV c.

Statement showing the Financial Results of Irrigation Works in Sind for the year ended 1886-87 based on Assessments of the year. Principal Results and Operations for the year ended 31st March 1887.

Irrigation Works.	Capital outlay (Direct and Indirect) to end of year.	Revenue Assessed during the year.								Grand Total.	Working Expenses, Direct and Indirect.	Net assessed Revenue of the year.	Percentage on Capital outlay to end of year.
		Direct Assessed Revenue.							Indirect Revenue, Land Revenue due to operation of Canal.				
		Occupier's Rates.	Owner's Rates.	Plantations.	Water-power.	Navigation.	Miscellaneous.	Total.					
Major Works.	Rs.	Rs.		Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Works.													
Desert Canal	11,57,842	36,936	...	...	...	...	210	37,146	65,311	1,02,457	48,915	53,542	4·62
Unharwah	3,28,444	...	...	2	...	...	30	32	43,773	43,805	15,935	27,870	8·49
Begári Canal	16,66,846	33,405	...	80	...	...	397	33,882	2,26,339	2,60,221	76,683	1,83,538	11·01
Eastern Nára Works	49,64,105	1,366	...	1,226	...	...	15,295	17,887	2,53,106	2,70,993	94,238	1,76,755	3·56
Total, Major Works ...	81,17,237	71,707	...	1,308	...	...	15,932	88,947	5,88,529	6,77,476	2,35,771	4,41,705	5·44
Minor Works and Navigation.													
Sukkur Canal...	13,88,713	719	...	106	...	...	717	1,542	90,416	91,958	30,444	61,514	4·43
Ghár Canal	4,40,977	1,378	...	838	...	...	2,510	4,726	3,62,986	3,67,712	1,69,591	1,98,121	44·93
Mehrabwah	67,869	...	...	20	...	...	64	84	21,110	21,194	15,420	5,774	8·51
Alibhar Kacheri Canal	23,917	441	...	15	...	...	...	456	4,871	5,327	5,936	—609	2·55
Márak Great Canal	2,01,553	1,700	...	165	...	...	191	2,056	44,197	46,253	16,207	30,046	14·91
Surfrazwah	1,24,680	1,487	...	36	...	...	336	1,859	17,443	19,302	15,990	3,312	2·66
Fuleli Canal	9,63,475	18,914	...	1,940	...	...	3,870	24,724	3,06,598	3,31,322	1,86,915	1,44,407	14·99
Total, Minor Works and Navigation .	32,11,184	24,639	...	3,120	...	...	7,688	35,447	8,47,621	8,83,068	4,40,503	4,42,565	13·78
Grand Total ...	1,13,28,421	96,346	...	4,428	...	...	23,620	1,24,394	14,36,150	15,60,544	6,76,274	8,84,270	7·81

W. I. LeBRETON, Major,
Examiner of Public Works Accounts.

Temple deva
Sui
Desert Canal
Jhalpat
Jacobabad
Begari Canals
Shikarpur Canals
Khaira Garhi
Gandaka
Shadadpur
Ghaibi deva
Kambar
Larkana
Nasirabad
Mehar
Sita
Kakar
Pulji
Joki
Dadu
Mora
Chini
Bhan
Shah Hasan
Daulatpur
Sehwan
Jhangara
Kazi Ahmed
Lakhi
Amri
Sakrand
Sann
Manjhand
Syadabad
Shahdadpur
Brahmanabad
Kot Imamgarh
Kot Diji
Khairpur
Sangrur
Mirpur
Ubaura
Ghotki
Sukkur
Rohri
Shikarpur
Naushara
Hyderabad Canals
Tando Allahyar
Mirpur
Sindri
Kipra
Umarkot
Nabisar
Chachra
Shah Bilawal
Sonmiani
Karachi
Haidarabad
Kotri
Tando Adam
Mirpur Khas
Desert
Eastern Nara
Western Nara
Lower Sindh Canal
Sukkur Canal
Khairpur Canal
Ghar Canal
Kakar Canal
Sehwan Canal
Jamrao Canal
Begari Canal
Desert Canal



INDEX MAP

of the

PROVINCE OF SIND

to accompany Canal Revenue Report

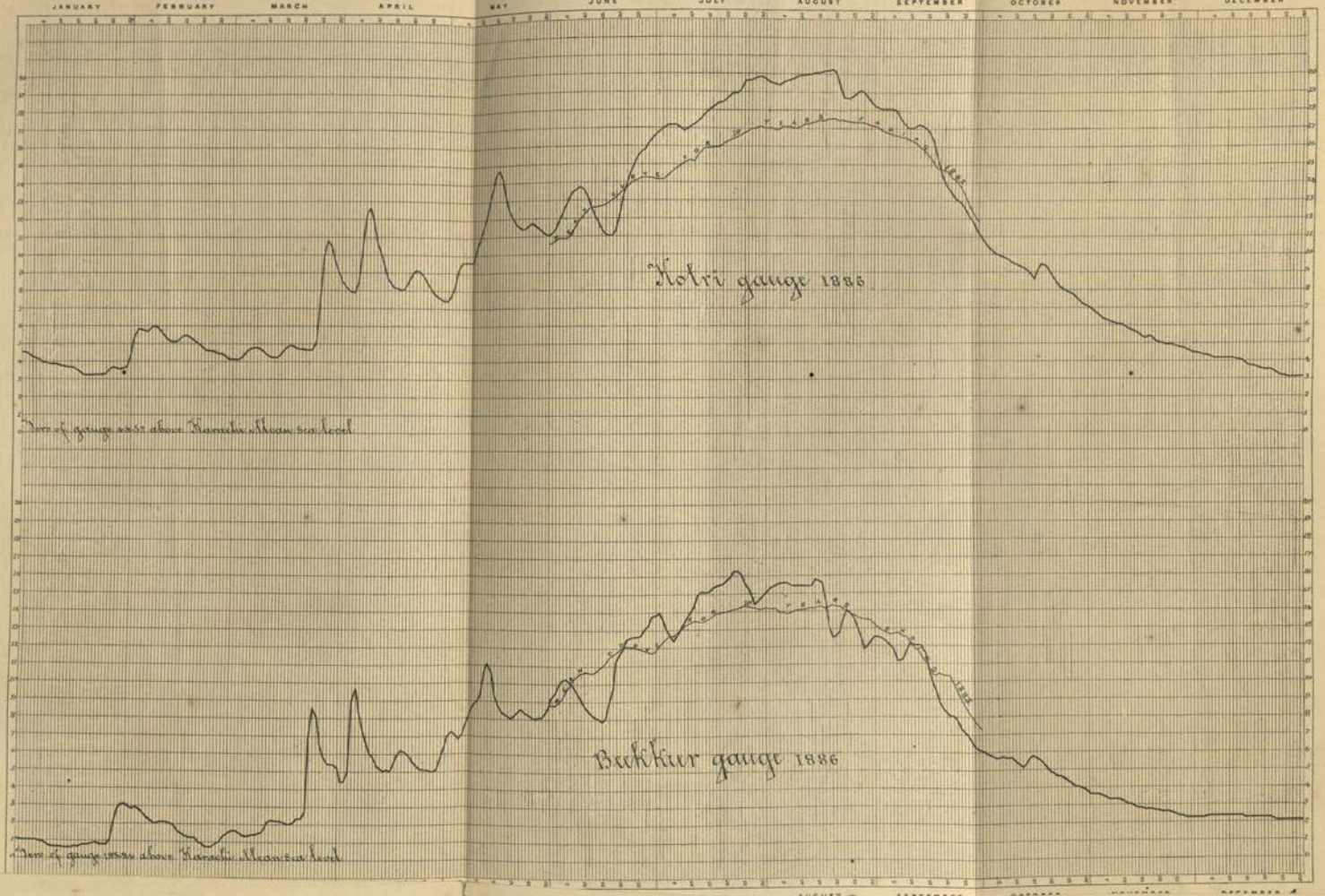
Scale 16 Miles to an Inch.

Note. Roads ruled as far as possible in straight lines
Boundaries of Canal Districts shown in blue lines
dotted lines

Karachi 18th September 1880.

Photozincographed from a Lithograph
Govt Photozinco Office, Poona, 1883.

(Signed) Geo. Lambert. M. Inst. C.E.
Supt Engineer
for Irrigation in Sind.


JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
Kotri gauge 1886
Bukkur gauge 1886

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1887-88.

[Price—Seven Annas.]

BOMBAY BRANCH
OF THE
Royal Asiatic Society.
CLASS

LIBRARY
OF THE
BOMBAY
BRANCH
OF THE
ROYAL ASIATIC SOCIETY.

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1887-88.

INDEX.

	PAGES.
General review of the results for the whole Province of Sind	1 to 10
Begári Canals	10 to 12
Shikárpur Canals	12 & 13
Ghár Canals	13 to 15
Eastern Nára Canals	15 & 16
Hyderabad Canals	16 to 18
Fuleli Canals	18 & 19
Karáchi Canals	19 & 20
Table I.—Cultivation and water share of net Consolidated Revenue for 1887-88 and three previous years	i
Table II.—Area of cultivation and Canal Revenue for 1887-88 and five previous years	i
Table III.—Area of cultivation and Canal Revenue for 1887-88	ii
Table IV.—Revenue Expenditure on new works, Maintenance and Repairs and Revenue Collection Charges in the Civil Department for 1887-88 ...	iii
Table V.—Cultivation, Canal Revenue and Expenditure for 1887-88 as contrasted with three previous years	iv
Table VI.—Direct and Indirect Receipts of Canal Revenue for 1887-88 ...	v
Table VIA.—Actual Direct and Indirect Receipts of Canal Revenue in 1887-88, as shown in General Revenue Accounts of Executive Districts prepared by the Examiner, Public Works Accounts	vi
Table VII.—Area of cultivation and Consolidated Revenue for 1887-88 ...	vii
Table VIII.—Discharges of certain Canals, areas of crops of different kinds irrigated, and duty of water per cubic foot of supply for kharíf season 1887	viii
Table IX.—Rainfall in the Province of Sind for 1887-88	ix
Memorandum showing the amount of loss to Canals on account of difference between assessments of water-rates on Jághír lands and the assessments at the ordinary rates in force for Government lands	x
Statement No. IB.—Capital Account of Irrigation Works in Sind for and to end of 1887-88	xi
Statement No. IC.—Statement showing Financial results of Irrigation Works in Sind for the year ending 31st March 1888—Realizations under main heads of revenue and working expenses	xii
Statement No. IIC.—Statement showing the Financial results of Irrigation Works in Sind for 1887-88 based on actual receipts—principal results of operations for the year ended 31st March 1888	xiii
Statement No. IIIC.—Demands and realizations during the year 1887-88 in Sind	xiv
Statement No. IVC.—Statement showing Financial Result of Irrigation Works in Sind for the year 1887-88 based on assessments of the year—Principal results and operations for the year ended 31st March 1888	xv
General Abstract of Financial Results	xvi & xvii
Series of readings on the Bukkur and Kotri Gauges	xviii
List of highest readings on Bukkur and Kotri Gauges for 10 years from 1878 to 1887	xix
Chart showing readings at Kotri and Bukkur Gauges for 1887.	
Index Map of the Province of Sind.	
Letter from the Superintending Engineer for Irrigation in Sind, No. 3861, dated 20th December 1888.	
Memorandum from the Commissioner in Sind, No. 399, dated 31st January 1889.	

ANNUAL REVENUE REPORT

OF THE

IRRIGATION DEPARTMENT IN SIND

FOR 1887-88.

The gauge readings of the river Indus at Bukkur during the kharíf season of 1887 indicated a very poor inundation. A small rise of water first took place on the 12th of May; but this had only increased on the 15th of the same month to 8′ 7″. The river then fluctuated up to the 8th of June, when it reached a height of only 10′ 5″; but from that date a very unseasonable fall set in, and it gradually went down to 8′ 4″ on the 2nd of July, or three inches lower than was indicated on the 15th of the previous May. On the 3rd of July it commenced a steady but very slow rise which continued up to the 18th of August when it reached its maximum height of 16′ 7″ for the season. It then took a sudden, and very unseasonable downward turn, which may be said to have terminated the flow, or "moke" inundation for the season on the 4th, and the general inundation, except in the case of very large and deep canals, on the 10th of September.

The maximum height gauged on the 18th of August at Bukkur is the highest on record except that of 1882, when it reached 17′ 7″; but in that year the river rose early, and fell late, while in the season under review the reverse was the case; besides it only retained its maximum height for one day which was a most unusual incident.

2. An average working height for the commencement of an inundation may be taken as 12′ on the Bukkur gauge, and on that of Kotri as 15′; and as these heights are approached or not, in the month of June, a fair forecast of the promise of the inundation may be arrived at; but when the people see the month pass by, and no indication of those heights of water being reached, they become discouraged, and curtail their preparations for cultivation. The heights on the gauges as above denoted give a fair supply in most canals to allow of ploughing being commenced, but on canals where rice is largely grown, it is only over restricted areas that sufficient water can be obtained, to grow seedlings with. The 18th of June may be taken as a fair average of the latest date when the river should be at the height stated as encouraging to the cultivators; but if a further rise of 2′ at least does not take place before the middle of July, the area of land which can be ploughed becomes, as a matter of course, restricted; and this is no cause of surprise, when it is remembered that the land must all be softened by water before it can be ploughed, and the cattle which should be working the ploughs, are necessarily retained to work the water-wheels. A late rise also prevents rice lands, which should be wetted by flow, being fit for transplanting operations when the seedlings are ready; and if rice seedlings are overgrown they are useless; and the cultivators have recourse to broad cast sowing which is wasteful to them, very wasteful of water-supply, injurious to the land, and generally productive of poor results both in quality and quantity of the crop.

It will be seen by the charts, attached, that the river did not rise to what is stated as its encouraging working height at Bukkur, until about the 18th of July, and at Kotri not much before the same date, or quite a month too late to constitute a good inundation. It also fell so rapidly that the generally useful supply was over at Bukkur on the 4th of September, and at Kotri on the 15th of the same month.

3. One of the most notable changes in the inundations of late years is the rise in the height of the head of water in all canals below Sehwan, and at certain periods of the kharif season in all the canals. This, as I said in my last year's report, is due to the retention of the water to the river, and within the Upper Sind river embankments. The manifestation of this confinement and storage of water is also proved by the uneven rises indicated on the gauges at Bukkur and

Kotri, as the season progresses. It will be seen from the comparative statement attached, showing a series of readings on both gauges, and also from the charts of the gauges, that in June and July, while only sufficient water passed down to fill the actual channel of the flowing river, the rise at Kotri was exactly parallel to that at Bukkur with the difference that the former kept about 2′ above the latter, which is solely due to a difference of datum. As the river rose in August above its working height, the overflow-supply was not used, or needed, but became stored and banked up, and at this time an increase in difference of over 4′ in the height of the readings took place between Bukkur and Kotri, which held good to the very end of the season. It will be also seen from the charts and statement that while the river could carry away the supply passing Bukkur, there were the usual three to four days' difference between the rise of water indicated on the upper and lower gauges; but once the river became full and overflowed, and the water headed up above, the intervals increased in length, until on the 17th of August, when the water had decidedly turned down at Bukkur, it still continued to rise at Kotri until the 24th of the same month; and although it then showed a daily decrease, the average of 4′ was maintained above the Bukkur reading, fully proving that the water must have been stored above, in the reaches of the river below Bukkur. This also proves the fact, that the steady rise in head of 2′ in all the lower Sind canals comes from this storage of water, which is entirely due to the protective embankments.

4. There were no very sweeping changes in the course of the river to be reported during 1887; but in the Begári District it continued to approach the Kashmor Bund opposite the 40th mile, and reached within 950 feet of it. It may be as well to mention here that the encroachment has since continued, and cut the outer bund in July this year. The erosion is stopped, and the inner loop erected in 1885 is in perfect order, and retained the flood. In the Shikárpur District the river approached to within 115 feet of the Sukkur-Begári Bund opposite the 25th mile; but after the erection of a short inner loop it suddenly changed its course to its left bank, and threw up kacha land where it had before eroded. The erosions in the Ghár Canal District continued in much the same line as last season; but had not the damaging effects. At Madaji it carried away the Bunds, and left the country unprotected; but fortunately there were no floods, as the river fell so rapidly that it did not overflow its natural banks. During a portion of the season it did take a course in an old channel by its left bank; but later on returned to its right bank, and continued eroding up to the end of the year. There was little or no erosion near the Fordwah; but from that point it changed over to its left bank, and from there directed its course to its right bank again, straight on to the mouth of the Western Nára, into which it threw much silt. A steady but slow erosion continued below the Western Nára, and opposite the Abad Bund; doing no material harm, except that its direct action on the river bank caused a higher heading up of water against the bund, and started several leaks, which gave some trouble in closing. Between October 1886 and June 1887 there was no erosion along the line of the Naughashah and Magsi Bunds; but from the latter date the river cut in very rapidly. In August it was within 50 feet of the Magsi Bund; but the lateness of the season was taken into consideration, and nothing was done towards a new loop. The river quickly fell below the ground level, but continued its erosion and eventually reached and carried away the bund. The river was in a very unsettled state near the heads of the Dambro and Dadwahs, and threw much silt into the first-named canal. It continued more or less to hug its left bank until it reached some 20 miles below Sehwan. Opposite Sehwan it continued to throw up new land, and consequently the Aral is still in a very hopeless state, and must remain so, until the return of the river to its right bank channel, or some very radical and expensive changes are made in the manner of its supply. Below Laki heavy erosion took place on the right bank, the river forsaking the left, and throwing up large deposits in front of the Gharos which feed the Reinwah which left them comparatively dry. This affected the canal (the Rein) most seriously, and led to falling off in the cultivation on it. Below this point no notable changes took place, except the usual minor changes of channel which occur every year, until the two great branches of the Delta were reached, where the river bifurcates into the Uchita and Haidari. About three miles of the head, or northern portion of the island formed by these branches has been eroded, and the features of the

river much changed. The main stream is now the Haidari, and it can be seen that at no distant date the Uchita will become only a minor, and very likely a controllable, water-course like the Baghar, and other similar channels.

5. The agricultural operations and the financial results of the year under review are the best on record notwithstanding the poor inundation. The kharif area was 1,438,216 acres, the rabi area 215,411 acres, the total under both being 1,653,627 acres, yielding as irrigation share a revenue of Rs. 37,20,291. The following table exhibits the cultivation and revenue of the year and five previous ones:—

TABLE A.

Year.	Area of Cultivation.			Irrigation Share of net consolidated Assessment.
	Kharif.	Rabi.	Total.	
	Acres.	Acres.	Acres.	Rs.
1882-83	1,281,691	226,601	1,508,292	32,02,048
1883-84	1,197,513	164,594	1,362,107	31,68,358
1884-85	1,353,960	232,319	1,586,279	36,16,370
1885-86	1,288,855	243,867	1,532,722	34,33,190
1886-87	1,407,778	185,888	1,593,666	35,89,499
Average	1,305,959	210,654	1,516,613	34,01,893
1887-88	1,438,216	215,411	1,653,627	37,20,291
Increase or Decrease	+132,257	+4,757	+137,014	+3,18,398

It will be seen that both the kharif and rabi area have considerably increased, not only as compared with the average, but also with those for previous years individually. As compared with the past year the increase under kharif and rabi is 30,438 and 29,523 acres, respectively, or a total of 59,961 acres; the increase in the irrigation share is Rs. 1,30,792.

6. The following table contrasts the area of cultivation and irrigation share of net consolidated revenue for the previous year, and the year under review, for each canal district, separately:—

TABLE B.

Canals and Districts.	1886-87.		1887-88.		Results.	
	Cultivation, Kharif and Rabi.	Irrigation Share of net consolidated Revenue.	Cultivation, Kharif and Rabi.	Irrigation Share of net Consolidated Revenue.	Cultivation, Kharif and Rabi.	Irrigation Share of net Consolidated Revenue.
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
Begári Canals ...	204,225	3,69,932	209,590	3,80,624	+5,365	+10,692
Shikárpur Canals .	118,623	3,08,363	125,546	3,22,473	+6,923	+14,110
Ghár Canals ...	371,011	10,39,583	371,010	10,31,119	-1	-8,464
Eastern Nára Canals	133,189	2,56,550	168,145	3,15,802	+34,956	+59,252
Hyderabad Canals .	309,572	6,00,052	307,704	6,13,847	-1,868	+13,795
Fuleli Canals ...	214,266	4,74,182	237,060	5,29,157	+22,794	+54,975
Karáchi Canals ..	242,780	5,40,837	234,572	5,27,269	-8,208	-13,561
Total ...	1,593,666	35,89,499	1,653,627	37,20,291	+59,961	+1,30,792

The total increase as shown in the above table is 59,961 acres. This increase is contributed by the Begári, Shikárpur, Eastern Nára, and Fuleli Canals Districts, and can only be attributed to the favourable working of the canals in them, and to the cultivators having taken advantage of the extra clearance, and increased their cultivation. The decrease in the Ghár District, as compared with last year,

is only 1 acre, but the decrease in the revenue is Rs. 8,464: this is due to remissions amounting to Rs. 21,387 having been given for failure of supply in the Ghár and Sukkur Canals, and partly to a change in the class of crops grown, paying a reduced assessment. It is not clear whether the acreage on which the remissions were given is entered with the cultivated area, but if it is not, it would amount to at least 10,000 acres, and increase the area watered, instead of showing a decrease of one acre. It should be remembered that where remissions are granted, in every case certain watering have been given to the lands, and at least $\frac{1}{3}$rd or $\frac{1}{2}$ of the remitted amount might have been secured if the water had been restricted to a less area than it was wasted over to no advantage to the revenue. Although in the Hyderabad Canals District there was a decrease of 1,868 acres, there was an increase in the revenue of Rs. 13,795; this is apparently due to enhanced rates having been levied under recent settlements: at any rate it cannot be accounted for in any other way.

7. The following detailed table represents collectively (1) irrigation share of net consolidated revenue, (2) hakába from jághirs, (3) miscelleneous receipts:—

TABLE C.

Years.	Begári Canals.	Shikárpur Canals.	Ghár Canals.	Eastern Nára Canals.	Hyderabad Canals.	Fuleli Canals.	Karáchi Canals.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1882-83 ...	3,59,321	2,33,721	11,89,426	1,42,283	5,91,206	3,64,535	4,58,352	33,38,844
1883-84 ...	3,41,953	2,12,270	11,23,953	1,85,596	5,48,060	4,21,324	4,73,896	33,07,052
1884-85 ...	4,40,198	2,70,080	12,79,629	2,21,203	6,20,269	3,94,915	5,46,872	37,73,166
1885-86 ...	4,63,288	2,89,029	10,32,725	2,35,913	6,06,280	4,12,246	5,37,860	35,77,341
1886-87 ...	4,52,919	3,14,457	10,54,490	2,74,272	6,24,242	5,02,296	5,55,309	37,77,985
Average ...	4,11,536	2,63,911	11,36,045	2,11,853	5,98,011	4,19,063	5,14,458	35,54,877
1887-88 ...	4,43,349	3,27,512	10,44,511	3,31,794	6,31,633	5,53,292	5,45,993	38,78,084
Increase or Decrease ...	+ 31,813	+ 63,601	— 91,534	+1,19,941	+33,622	+1,34,229	+31,535	+3,23,207

As compared with the average of 5 previous years the earnings of all the districts, with the exception of the Ghár, show an increase, the total increase being Rs. 3,23,207, but comparing them with the previous year there has been a falling off in the Begári, Ghár and Karáchi Canals districts. This is due to the hakába from jághirs being Rs. 29,526 less, and micellaneous receipts reduced by Rs. 3,167. For the Province the total falling off under these heads are Rs. 32,693 during the year under review, and the falling off in the irrigation revenue of Rs. 22,023, in the Ghár and Karáchi districts, makes the total decrease up to Rs. 54,723. The decreases under the heads, *viz.*, hakába and miscellaneous shown above, are not explained in any return submitted to this office, so the reasons for them cannot be explained. This does not seem to be satisfactory, and might be rectified.

8. The jághir area cultivated during the year has not been as satisfactory in comparison as the area cultivated on Government lands proper, as will be seen from the following table:—

TABLE D.

District.	Area cultivated during the year.	Unrealized Balance at end of the year.	Assessment of the year.		Total.	Remission during year.	Net total Realizable.	Actual Realization during year.	Balance outstanding at end of year.
			Area.	Amount.					
	Acres.	Rs.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Khelát	63,853	63,774	63,853	64,083	1,27,857	1,425	1,26,432	58,925	67,507
Upper Sind Frontier	842	350	842	413	763	...	763	390	373
Shikárpur	29,423	2,118	29,423	12,334	14,452	25	14,427	9,685	4,742
Thar and Párkar	1,314	18	1,314	628	646	...	646	581	65
Hyderabád	104,029	20,859	104,029	33,744	54,603	...	54,603	33,731	20,872
Karáchi	18,026	3,169	18,026	7,093	10,262	...	10,262	9,008	1,254
1887-88	217,487	90,288	217,487	1,18,295	2,08,583	1,450	2,07,133	1,12,320	94,813
1886-87	220,984	1,31,467	220,984	1,23,598	2,55,065	24,942	2,30,123	1,39,834	90,289
Difference ...	-3,497	-41,179	-3,497	-5,303	-46,482	-23,492	-22,990	-27,514	+4,524

Taking the cultivated jághír area of the province as a whole, the decrease is 3,497 acres. This is chiefly due to a smaller area of cultivation in Khelát. The falling off on the Begári Canal in Khelát is shown as 5,531 acres; but the increase of 1,451 acres on the Desert Canal reduces it to 4,080 acres. Against the falling off of cultivation over the border, there was an increase within the frontier of 583 acres on the Begári Canal, which reduces the decrease on it to 3,497 acres. It is difficult to account for the decrease in Khelát unless it is due to the want of some proper demarcation of the areas of land cultivated, as the Political Agent, South-Eastern Baluchistán, reported that the water-supply was good, and that where the crops had been already measured up to date, there was a great increase over last year's cultivation.

The total amount under this head of revenue, including unrealized balances at the end of the year, was Rs. 2,08,584; of this only Rs. 1,12,320 were collected during the year, which left an outstanding balance of Rs. 94,813, or Rs. 4,524 more than the year before, although the amount to be collected was less.

The largest outstanding was still in Khelát territory, and as the probable reasons for this have been fully ventilated already, it needs nothing more here than to say that, with cultivators notoriously well off, having every facility of water-supply, and excellent land to deal with, it is a matter of surprise that they are allowed to remove any of their crops before the revenue is paid.

9. In the Government of India's Resolution No. 96-I, dated 22nd May 1888, on last year's revenue report of irrigation works in Sind, certain remarks are made in paragraph 3, with regard to the amounts of canal revenue, which may be said to remain in the hands of Jághirdárs in lieu of pensions.

10. The following table shows what these amounts are under various heads:—

TABLE D (*a*).

Class of Works.	Hakába at present.	Loss.	Jághir Revenue, what it ought to be.	Water share of Government Land.	Total, what it should be for the Province.
	Rs.	Rs.	Rs.	Rs.	Rs.
Major works	62,597	70,750	1,33,347	7,01,210	8,34,557
Minor do. (Capital)	5,894	1,73,186	1,79,080	12,56,404	14,35,484
Do. do. (Revenue)	44,012	1,56,894	2,00,906	17,62,677	19,63,583
Total ...	1,12,503	4,00,830	5,13,333	37,20,291	42,33,624

There are in Sind what may be called two classes of Political pensions, that is, those who receive their pensions direct in cash, and those who receive it in kind, at the cost of canal revenue. There seems to be no reason why the two kinds of payments should not be classed under the same head, and it would only be fair to credit the Provincial canal revenue with the contribution it makes in kind to these Imperial pensioners, who are constantly having their incomes enhanced, by all extra expenditure, and improvements made on the canals. If the payments indirectly made in the year under review are taken into account, the total revenue would be increased by Rs. 4,00,830, and the total Provincial canal revenue would be increased to Rs. 42,33,624.

11. The following table shows the total revenue to be collected and what was actually realized during the year; also Tables VI and VI A attached, wherein the direct and indirect receipts of canal revenue are exhibited.

TABLE E.

Districts.	Net Amount realizable on account of outstandings at beginning of year.	Total for collection.	Actual realization.	Balance outstanding.	Irrigation share of collection.
	Rs.	Rs.	Rs.	Rs.	Rs.
Upper Sind Frontier	24,600	4,53,955	4,42,884	11,071	3,98,596
Shikárpur	18,340	15,10,995	15,04,861	6,134	13,54,379
Thar and Párkar	...	3,37,585	3,37,332	253	3,03,599
Hyderabad	28,081	12,92,516	12,87,529	4,987	11,58,776
Karáchi...	21,034	6,10,132	5,89,980	20,152	5,30,983
	92,055	42,05,183	41,62,586	42,597	37,46,333
Total 1886-87 ...	...	41,02,756	40,10,701	92,055	36,09,629

It can be seen from the above table that the results for the year under all heads were very satisfactory. In the first place the actual increased realizations were Rs. 1,51,885 more than 1886-87, and secondly the outstanding balance only amounted to Rs. 42,597, or less than last year's by Rs. 49,458. This shows a very decided advance in the ease with which the revenue is collected, and is an evidence that the resources of the province are steadily increasing, and that the people are more readily able to meet their liabilities and the necessary demands made upon them.

In Shikárpur the amounts to be collected were slightly less than in the year before; but in all the other districts they were higher. It is remarkable that in the two districts of Hyderabad and Shikárpur, paying the largest revenues which in each is nearly three times the amount of any of the other three districts, the outstandings are small. The outstandings in Thar and Párkar are small as compared with the collection; but the outstandings in Upper Sind Frontier and Karáchi are high, as compared with the other districts of the province and their own revenues.

12. The remissions for the year under review, and 6 previous years are given below:—

TABLE F.

Districts.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	Average.	1887-88.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	...	...	4,685	3,376	10,708	20,335	6,517	13,032
Shikárpur Canals	58	842	6,814	369	123	668	1,479	101
Ghár Canals	9,268	66,818	17,312	27,585	1,12,111	92,277	54,228	21,387
Eastern Nára Canals	2,504	13,476	910	267	4,413	43	3,602	177
Hyderabad Canals	911	18,817	493	60,391	2,757	3,418	14,465	3,031
Fuleli Canals	2,917	5,248	1,036	3,246	1,413	707	2,428	3,203
Karáchi Canals	19,194	1,06,505	61,621	16,814	24,891	18,971	41,333	21,006
	34,852	2,11,706	92,871	1,12,048	1,56,416	1,36,419	1,24,052	61,937

The remissions for the year, with one exception, compare very favourably with those of other years, and also with the average of 6 previous years, with the exception of the Begári and Fuleli Canals districts. The heaviest remissions given were in the Begári, Ghár and Karáchi Canals districts, and these are due apparently to the low inundation, and therefore the want of the necessary head of flow or "moke" supply in the canals; but on the whole the smallness of the loss by remission is satisfactory, as being the lowest on record, with the exception of one year (1881-82) shown in the series of years noted in the above table.

It may be accepted as a fact that, had the canals not been in excellent working order, remissions would have been claimed, and granted much more extensively than was the case; and that the admirable results shown for the year's cultivation and revenue would have been frustrated by the poor inundation.

13. The expenditure incurred during the year on account of maintenance and repairs of all the canals and bunds in the districts, shows an increase over that of each 6 previous years, and their average also, as will be seen from the following table:—

TABLE G.

Years.	Maintenance and Repairs.			Revenue Collection Charges.	Total.
	Works.	Establishment.	Total.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1881-82	8,86,044	2,12,897	10,98,941	2,74,070	13,73,011
1882-83	8,68,991	2,22,036	10,91,027	2,72,652	13,63,679
1883-84	8,78,816	2,14,128	10,92,944	2,74,762	13,67,706
1884-85	8,53,757	2,13,717	10,67,474	3,36,613	14,04,087
1885-86	8,31,148	2,48,524	10,79,672	3,16,215	13,95,887
1886-87	8,27,922	2,71,930	10,99,852	3,29,394	14,29,246
Average	8,57,780	2,30,538	10,88,318	3,00,618	13,88,936
1887-88	10,41,501	2,61,116	13,02,617	3,41,170	16,43,787
Difference	+1,83,721	+30,578	+2,14,299	+40,552	+2,54,851

The increase compared with the average of 6 previous years is Rs. 1,83,721, and compared with the previous year it is Rs. 2,13,579. This is due to the canal clearance grant of the province having been raised to Rs. 8,40,000 and also to the extra grant made available by Government about the end of the year under review. The excess expenditure was rendered necessary by the short amount of grants in previous years, and the consequent decay of the canals. However it is a matter of congratulation that the expenditure well paid for itself, and there is no doubt that a much larger expenditure on canals in Sind would be much more than covered.

14. The following table is added to the report. It shows the division of expenditure shown in the above table between canals and bunds for the same series of years:—

TABLE G (*a*).

Maintenance and Repairs of Canals and Bunds.

Years.	Canals.					Bunds.				
	Works.	Establishment.	Total.	Revenue Collection.	Grand Total.	Works.	Establishment.	Total.	Revenue Collection.	Grand Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1881-82	7,22,995	1,83,554	9,06,549	2,73,070	11,79,619	1,63,049	29,343	1,92,392	1,000	1,93,392
1882-83	7,17,883	1,87,930	9,05,813	2,71,515	11,77,328	1,51,108	34,106	1,85,214	1,137	1,86,351
1883-84	6,99,084	1,75,403	8,74,487	2,73,688	11,48,175	1,79,732	38,725	2,18,457	1,074	2,19,531
1884-85	7,40,540	1,93,796	9,34,336	3,34,972	12,69,308	1,13,217	19,921	1,33,138	1,641	1,34,779
1885-86	7,11,982	2,19,200	9,31,182	3,14,002	12,45,184	1,19,166	29,324	1,48,490	2,213	1,50,703
1886-87	6,62,498	2,23,334	8,85,832	3,28,154	12,13,986	1,65,424	48,596	2,14,020	1,240	2,15,260
Average	7,09,163	1,97,203	9,06,366	2,99,234	12,05,600	1,48,616	33,336	1,81,952	1,384	1,83,336
1887-88	8,58,758	2,21,266	10,80,024	3,40,424	14,20,448	1,82,743	39,850	2,22,593	746	2,23,339
Difference	+1,49,595	+24,063	+1,73,658	+41,190	+2,14,848	+34,127	+6,514	+40,641	—638	+40,003

It will be seen from the above that much of the canal clearance grant was annually expended for the maintenance and repairs of bunds, and the cost debited to the revenue of the canals of the province: but as it is a fact that the entire chain of bunds serve other important purposes, unconnected with irrigation, the time appears to have arrived, when a portion of the grant annually required for them should be debited to other heads than irrigation funds. If this were done, a greater portion of the amount annually expended on bunds could be set free for

canal clearances, any increased outlay on which is invariably attended with increased cultivation and revenue. This is an important question, and it would be well if steps could be taken to rectify it at an early date. Some years ago when the Ruk-Sibi Railway was threatened by floods, part of the cost of a loop to the Kashmor Bund was borne by the Railway Department; there is, therefore full reason why some contribution should be made for the up-keep of such bunds from at least the Railway Department. The Railway authorities argue that the Irrigation Department are bound to protect the interest of the Railway in common with other interests, and no doubt, as long as this department is entrusted with the care of the river embankments that is true; but as there could be no Railway without these protective embankments, it seems an anomaly that a great imperial revenue-earning work, like the North-Western Railway, should be solely protected at the expense of the Sind Irrigation works. The river embankments, to a great extent, should be looked upon as Imperial works from other points of view besides the protection they render the Railway; as they are, through the protection they render to every class of property, undoubtedly leading to a more contented and settled spirit amongst the people, which must be a gain to the Empire as well as to the Province.

15. The expenditure on extensions and improvements are shown in detail in Table IV. The total expenditure for the province incurred under this head was or—

	Rs.
Works	... 1,67,420
Establishment	... 36,676
Total	... 2,04,096

16. The following table shows percentage of expenditure on revenue (exclusive of expenditure on extensions and improvements) taking only the cost of maintenance and repairs, and Public Works Establishment and Revenue collection charges, and the cost of maintenance per acre for the year and 6 preceding years :—

TABLE H.

Years.	Cultivation.	Net Canal Revenue.	Expenditure.			Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.
			Maintenance and Repairs.	Revenue Collection.	Total.		
	Rs.	Rs.	Rs.	Rs.	Rs.		
1881-82	16,01,986	33,45,741	10,98,941	2,74,070	13,73,011	41·04	0·86
1882-83	16,73,293	33,38,844	10,91,027	2,72,652	13,63,679	40·84	0·82
1883-84	15,40,831	33,07,052	10,92,944	2,74,762	13,67,706	41·36	0·88
1884-85	17,83,173	37,73,166	10,67,474	3,36,613	14,04,087	37·21	0·79
1885-86	17,39,919	35,77,341	10,79,672	3,16,215	13,95,887	39·02	0·80
1886-87	18,14,650	37,77,985	10,99,852	3,29,394	14,29,246	37·83	0·80
Average	16,92,309	35,20,021	10,88,318	3,00,618	13,88,936	39·46	0·82
1887-88	18,71,114	38,78,084	13,02,617	3,41,170	16,43,787	42·4	0·88

It is seen from the above that the cost of maintenance and repairs and establishment charges is Rs. 16,43,787, and therefore higher than any of the preceding years, and as a matter of course, their average also. This is due to increased cost of revenue establishment owing to the revenue for collection having been greater than the 6 previous years. The increased cost of revenue establishment is only apparent, and not real, as it is obtained by taking ten per cent. on the actual revenue, while the real charge would be the same, whether the revenue rose or fell. The revenue collection charges are nearly a third as great as the total expenditure on maintenance.

17. The following table shows the financial results of irrigation works in Sind for the year under review :—

TABLE I.

Class of Works.	Gross Revenue.	Working Expenses.	Net Revenue.	Simple Interest.	Net Profit.
	Rs.	Rs.	Rs.	Rs.	Rs.
Major Works (Productive Works) ...	7,51,677	2,43,023	5,08,654	3,17,639	1,91,015
Minor Works, Irrigation and Navigation, for which Capital and Revenue Accounts are kept	9,25,791	5,07,932	4,17,859	...	4,17,859
Minor Works, Irrigation and Navigation, for which only Revenue Accounts are kept	18,16,712	10,02,394	8,14,318	...	8,14,318
1887-88	34,46,180	17,53,349	17,40,831	3,17,639	14,23,192
1886-87	33,85,262	15,23,909	18,61,353	3,09,199	15,52,154
Difference ...	+61,452	+2,29,440	—1,20,522	+8,440	—1,28,962

The gross revenue of the year under the three classes of works shown above is better than that of last year, and if the working expenses had been as low as that year, the increase under this head would have been Rs. 2,90,892 : but as 33
increased expenditure had to be incurred owing to the state of the canals and bunds, the net profit for the year shows a decrease of Rs. 1,28,962, as compared with the preceding year. In speaking here of the working expenses having had a depreciable effect on the revenue (which is based on actual realizations) it must be remembered that the increased expenditure under this head had the effect of raising the assessed revenue of the year to Rs. 37,20,291, which has been already shown in paragraph 5 as the best result on record.

The increase in the working expenses and the apparent decrease in the net profit may be reviewed also from another point of view. The increase under assessed revenue as shown in table A, is Rs. 3,18,398 and the increased expenditure which produced it is Rs. 2,29,440, as compared with the previous year: if these are taken into account, in dealing with the figures in the above table, then the increase in the working expenses is not only paid off, but shows a balance of Rs. 88,958 to the credit of the canals, and reduces the decrease in the net profit from Rs. 1,28,962 to Rs. 40,004; so on the whole, the results under this head for the year are not at all unsatisfactory.

18. In the following table are shown the collection on account of Government and jághir lands, and miscellaneous receipts, and the expenditure and percentage for the year under review and four previous years:—

TABLE J.

Class of Works.	Years.	Water share of net consolidated Revenue collected.	Hakába and Miscellaneous.	Total collected.	Expenditure against Revenue.	Percentage.
		Rs.	Rs.	Rs.	Rs.	
Major Works—Productive Works.	1883-84 ...	4,51,934	68,292	5,20,226	1,79,225	34·4
	1884-85 ...	5,75,528	81,249	6,56,777	2,10,950	32·1
	1885-86 ...	6,29,781	71,615	7,01,396	2,13,057	30·4
	1886-87 ...	6,09,643	1,00,540	7,10,183	2,29,016	32·2
	1887-88 ...	7,01,210	78,491	7,79,701	2,36,607	30·3
Minor Works Irrigation and Navigation.	1883-84 ...	26,60,560	70,402	27,30,962	13,58,282	49·7
	1884-85 ...	31,18,293	75,547	31,93,840	13,76,024	43·1
	1885-86 ...	28,58,082	72,536	29,30,618	13,46,071	45·9
	1886-87 ...	29,99,986	87,946	30,87,932	14,50,492	46·9
	1887-88 ...	30,45,123	79,302	31,24,425	16,11,276	51·6
Whole of Sind... ...	1883-34 ...	31,12,494	1,38,694	32,51,188	15,37,507	47·3
	1884-85 ...	36,93,821	1,56,796	38,50,617	15,86,974	41·2
	1885-86 ...	34,87,863	1,44,151	36,32,014	15,59,128	42·9
	1886-87 ...	36,09,629	1,88,486	37,98,115	16,79,508	42·9
	1887-88 ...	37,46,333	1,57,793	39,04,126	18,47,883	47·3

It is seen from the above table that under head "Major Works" the collection of water share is the best for the series of years: the collection under "Minor Works" is a little less than in 1884-85, but the result under both heads is very satisfactory, and shows considerable improvement over those of previous years. The percentage of expenditure on revenue is 47·3: this is high, but not higher than in 1883-84, when the water share of the net consolidated revenue collected was Rs. 6,52,938 less. Under this head "Major Works" show an extremely favourable advance since 1883-84, having increased by Rs. 2,59,475, while the percentage on expenditure has decreased 4·1.

19. The mileage of canals and bunds in the province stands at 5,827, and 610 miles respectively against 5,824 and 602 of the preceding year: this shows an increase in each of 3 and 8 miles respectively. This increase has taken place in the Eastern Nára district by the excavation of a branch to the Mithrao Canal, and extension of its bunds. The mileage in other districts remains the same as it was last year.

20. In table VIII, in the appendix, it will be seen that the average discharge per cubic foot per second was generally below the inundation of 1886 in most of the canals, and therefore, as the area irrigated was greater, the duty got from the water was greater. The Desert Canal had a slightly better supply entirely due to its new river head. The Unharwah and Mithrao Canal had a slightly better supply, and gave considerably better results. The Fuleli shows a very considerable increase in discharge, reaching 1,853 cubic feet per second above last year; but this is accounted for by the discharge of the canals in the Hyderabad Táluka being entered for the first time this year. Heretofore the Fuleli discharge was gauged at the stone-bridge at Hyderabad, and the large discharge used off the old Fuleli Head for the Hyderabad Táluka canals omitted.

It can be seen that the only reduction in acreage watered on any of the canals took place on the Sind, Sukkur, and Ghár canals, and as the duty taken out of the water on all three canals is better than last year, it is very plain that their supply was defective. These three canals depend much on flow or "moke" as they are essentially rice-growing canals, but this area watered by flow has notably fallen off, particularly on the Ghár, where it is only 44,539 acres, against 128,889 in 1886.

The duty done by the water in dry-crop canals and the reverse is remarkable. Taking, for instance, the Desert and the Sukkur canals, which had fairly parallel discharges, the first only watered 366 acres of rice, while the latter watered 26,583; and the duty reached on the first is 55·35 acres per cubic foot of average discharge, while the latter's duty only reaches 30·56 acres per cubic foot. The duty on the Fuleli, which is essentially a wet-crop canal, is 32·00 acres per cubic foot. If an examination and comparison of the discharges and duty of the water done in the various classes of canals in Sind is made for this and past years, it is clearly seen that in designing a new irrigation canal, the fair average to be taken for a wet-crop canal should be 30 ~~cubic feet discharge per acre~~ acres per cubic foot discharge, and for a dry-crop canal 50 ~~cubic feet per~~ acres per cubic foot.

21. The rainfall in the province during the year was very small indeed, the average being 2 inches and 87 cents only, which is considerably less than the previous year. The fall in July and August of the kharif season, though small, was general, and did some good. The fall in January was also general, and helped the rabi crops to some extent. Table IX attached gives the detail of the rainfall of the province.

BEGA'RI CANALS.

22. *Kashmor Bund.*—The watching establishments on the bund were employed in the end of May, and discharged on the 15th of September. The flood level against the bund from the Begári Canal to the 22nd mile was considerably lower than usual; this of course was an advantage to the bund, but proved injurious to the supply in the canals, whose regulating heads are in the bund. From the 22nd mile to the end of the bund the water line nearly coincided with that of 1886. The cause of the low level of the water line against the bund in the first

22 miles, was due to the Wadhu Dhand cutting itself a channel back to the river. At this time the old bund near Kashmor remained intact, and little erosion of the bank took place except at the 41-42 mile; nothing affecting the stability of the old bund occurred during the season of 1886-87. Only one leak took place in the whole bund, and that in the first mile, and was supposed to be the remains of one of the old 1875 leaks re-opened. The leak has since been cut out, and thoroughly secured.

23. *Desert Canal.*—A new mouth through the "Kátcha" had to be dug to this canal (the reason for which please see paragraph 20 of Revenue Report of last year). It was finished in May, and the water admitted into the canal on the 25th of the same month. The canal worked for the season extremely well although the supply in June was rather short. The designed supply to this canal is 11 feet, but for 17 days it was increased to 12 feet, whilst ploughing and sowing were in active operation; and the result was to give ample flow or "moke" to lands which were classed as lift or "Churkhi" before. A few small breaches occurred in the canal banks, but did no damage, and were soon closed.

The average discharge for the season was 1,454 cubic feet per second, and judging from the former duty done by the supply in the canal, the area cultivated should have been 94,000 acres, but the actual return only came to 88,552 acres. The crops were excellent in quality and outturn.

24. *Muradwah.*—This canal is a branch of the Desert Canal, but has a separate head in the Kashmor Bund. Water was admitted into it on the same date as the main canal. The original designed depth of supply for this canal was only 6 feet; but this has been increased to 7·35 feet, which gives an ample supply for all the lands on the canal throughout the season. The full discharge with a depth of 7·35 feet is 460 cubic feet a second; the original full discharge being only 370 cubic feet; but the average discharge for the season reached 373·29, which ought to have given a cultivation of 15,000 acres, but only returned 7,928 acres. This may have improved in the rabi season, but as the rabi of this canal is included in the return for the Desert Canal, it cannot be clearly ascertained.

25. *Unharwah.*—Water was admitted into this canal on the 4th of June, the earliest date on which the canal would flow. During the entire month of June the supply was deficient, and it was not until the 7th of July a full supply was reached, and from that date until the end of the inundation the supply was abundant. The designed supply for this canal was 550 cubic feet per second, but the discharge during July and August of the season under review reached 920 cubic feet.

A few breaches occurred in the banks of the canal during the season, and the Regulator had to be partly shut for a few days to decrease the head of water while they were being closed. It is not an uncommon occurrence in the Frontier district to have the canal banks cut by cattle herds and others, for the purpose of flooding lands for grazing purposes, and some men who were caught in the act this season on this canal were convicted and sentenced to six months' imprisonment with a fine, which, it is hoped, will have a beneficial effect for the future, in the safety of the bunds, and the working of the canal. The small supply in June reduced the average supply for the season to 589·50 cubic feet per second, which was estimated to return only 27,500 acres of cultivation, but which really gave 29,406 acres. The lowness of water in this canal at first was due to the loss in the Wadhu Dhand, remarked on before. The crops on the canal were very fine.

26. *Begári Canal* was opened on the 23rd of May, but on account of the low inundation and the defective supply in the Wadhu Dhand, the supply was poor up to the 10th of July. After that date the supply improved, and on the 7th of August and up to the 22nd the supply was good, reaching 12·85 feet, or 10½ inches over full supply. The full designed supply is 12 feet, but during the past few inundations, since the banks have become consolidated, it has been the practice to admit a depth of even 13·75 feet, but unfortunately owing to the deficiency in the Wadhu Dhand, nothing beyond the height before mentioned of 12·85 feet could be got down during any part of the season. The Begári was designed to carry 3,750 cubic feet of water, and irrigate 187,500 acres of cultivation, but it

has since been discovered that the real bed level for the first 7 miles is 1·25, which, in an earthen channel like the Baghar, gives a hydraulic gradient of about a foot. This of course has increased the full discharge from 3,750 to 4,693 feet per second, and ensures the average supply in the canal to cover its estimated cultivation of 187,500 acres. The actual area cultivated in 1885-86 was 188,031, but owing to the bad supply in June this season the average supply was only 3,156·50 cubic feet, which was estimated to cultivate 157,825 acres, and really cultivated 157,600.

27. *Sonewah.*—This canal dried up earlier than usual, and the Regulator at the 19th mile of the Begári had to be constantly worked to force water down the canal. This of course for a time caused a deficiency in other branches lower down, and the 38th mile regulator had also to be worked. This again had a detrimental effect on the supply in the tail branches of the Begári, the Sir, and Eden canals. The distribution of the water was worked in consultation with the Revenue Officers, and was adopted in the best interest of the canal revenue, and to save the crops. There were no remissions claimed, but the crops were poor.

28. *Buxaliwah* commenced to flow on the 7th of June and the whole of the land lying between the outer and inner bunds was submerged, and the base of the new inner loop bund thoroughly saturated. The other six small canals through the Kashmor Bund had the usual supply, but the area cultivated on them fell off, and was only 3,840 acres against 5,269 acres in the preceding year.

29. The following table shows the total canal revenue collected on the canals in Upper Sind Frontier, the cost of maintenance, and revenue collections, the total charges against revenue, and the percentage for the year and four previous years:—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage on Maintenance and Revenue Collection.	Percentage of total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	3,38,979	1,60,780	1,85,468	47·5	54·7
1884-85	4,42,476	1,69,984	1,69,984	38·4	38·4
1885-86	4,77,172	1,80,345	1,80,345	37·8	37·8
1886-87	4,44,542	1,79,780	3,06,078	40·4	68·8
1887-88	4,54,979	1,96,853	2,52,249	43·27	55·44

The revenue collected during the year is less by Rs. 22,193 as compared with 1885-86, but it shows, however, considerable improvement over any of the other years, and is therefore on the whole favourable. The total charges against revenue is less by Rs. 53,829 than the previous year, and may be considered as satisfactory.

SHIKA'RPUR CANALS.

30. Notwithstanding the low inundation of the season the canals in the Rohri districts appear to have had a fair supply of water in them, sufficient for all ordinary requirements. This is borne out by the fact that there was an increase of 11,036 acres of cultivation, under both kharif and rabi, and an increase of Rs. 15,769 in the irrigation share of the net consolidated revenue, as compared with the previous year.

31. There is nothing notable to remark as regards the bunds in the Rohri districts, as the inundation having been a low one they stood well and there were of course no breaches: there were however a few leaks, and these were quickly detected and closed before doing mischief.

32. *Sind Canal* was opened on the 2nd June; the supply throughout the season was never good; the highest water level of the season being 2 feet below that of last year. The supply at the beginning was bad owing to the lowness of the river. From the middle of July to the end of August, however, the supply

was fair, and during this short period the cultivators received water by flow. Cultivation has fallen off to the extent of 4,113 acres as compared with the previous year. This reduces the increased area for the whole district from 11,036 acres to 6,923 acres as shown in table in the general review of this report.

33. The highest level the flood reached on the Sukkar-Begári Bund took place on the 19th August. The water level against it was much lower than last year: this is accounted for by the set of the river being full away towards its left bank, as explained in the opening part of this report. No breaches occurred. There were a few leaks, but they were promptly closed.

34. The financial results of all the canals and bunds in this district for the year under review and four previous years are shown in the following table :—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of total Charges.
		Maintenance and Revenue Collected.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	2,14,442	1,10,790	1,61,008	51·2	75·1
1884-85	2,73,536	1,14,899	1,67,241	42·0	61·1
1885-86	2,88,336	1,44,433	1,78,861	50·1	62·0
1886-87	3,18,769	1,62,045	1,84,627	58·3	57·9
1887-88	3,28,082	1,86,771	2,38,852	53·06	72·80

The total revenue collected during the year is better than any of the previous years, and as compared with the previous year, the increase is Rs. 9,313. The charges have increased owing to increased expenditure on canals, and increased revenue for collection.

GHA'R CANALS.

35. In this district the inundation extended over an exceptionally short period, as a fair supply did not commence in the canals until the 11th of July, and only lasted until the 4th of September. A full average supply should commence not later than the 15th of June, and last until the 15th of September. The irrigating kharif season may therefore be said to have been at least $\frac{1}{3}$ shorter than a proper average.

36. *River Embankments.*—The length of time the river took to rise over its natural banks very seriously affected the artificial embankments, as it is the rising and falling river which erodes so continuously. In the month of June two inner loops were completed to the main *Jhali Bund*, but erosion went on so rapidly, that a more retired loop had to be at once constructed 1,400 feet further in, which was completed by the 15th of July; but before this inner loop was quite completed, the river ate away the ground on which the main bund stood, and approached within 800 feet of the loop in construction. The river then rose over its banks and erosion stopped. From July to the end of August the river took an old channel on its right bank, but then returned with a more persistent eroding power, and carried away 450 feet of its bank in one night, approaching the bund within 200 feet. A week after it cut in, and carried away the bund, but as the water had fallen 9" below ground level no steps were then needed to prevent floods. The river did no damage during this season to the *Mithu Bund*. No erosion took place along the *Phulu Bund*, but the approach of the river to the *Western Nara* mouth caused anxiety for the future safety of the bund. The *Abad Bund* suffered but slightly from pressure of water against it, and required strengthening. After the river fell permanently for the season, a portion of the *Naughashah* and *Magsi Bunds* was eroded and fell in, and had to be rebuilt before the ensuing inundation.

Sukkur Canal.—For the kharif supply this canal was opened at the Rahuja head on the 4th of June; but a full supply did not reach it through the Dhora

which it feeds from until 27th of July; but from that date up to the 7th of September a very good supply was maintained. There were 55,188 acres of kharif cultivation against 55,929 in 1886-87 and of this area 18,348 acres were re-cultivated with a second crop (Dubhári) in the rabi season.

38. The *rabi supply* was admitted through the old head on the 28th of October 1887, and lasted until the 20th of March 1888, and the increase of area cultivated over last year was 5,258 acres. The whole area cultivated actually paying full revenue under this head was only 15,533 acres; which is not at all encouraging, or satisfactory, when the great cost of maintaining the cold weather supply is taken into consideration. In the foregoing paragraph it is seen that 18,348 acres were re-cultivated under the system of "Dubhári" or second-cropping; but this land only paid 4 annas an acre to the Revenue, none of which is credited to the canal. This Revenue system is ruinous to the Sukkur Canal, although working well and very fairly on ordinary unregulated inundation canals. There is no detail to show how much of the 18,345 acres received full rabi water, and how much only partial; but it is estimated at a very low rate by the Irrigation officers that the canal lost a credit of at least Rs. 32,000 by this system of "Dubhári."

39. *Ghár Canal* was opened on the 30th of May, and worked much better than during the past year. There was very little silt deposited in any part of the main canal or branches. There was a poor supply for wet crop until the 9th of August, when it became good, but lasted up to the 12th of September only; so jowári crops extensively re-placed rice. There was a decrease of 734 acres of cultivation on the canal, and the lower assessment on jowári crops caused a falling off in the Revenue.

40. *The Fordwah* worked very badly during the season, owing chiefly to the set of the river at its head, and gave very little assistance to the Ghár supply.

41. Jowári crops were new, and rather an experiment to the Zamindárs on the Ghár Canal, particularly on its tail branches, as they were under the impression that the lands were only fit to grow rice or wheat; but having now seen the excellent crops obtained, it is hoped, and expected that in the future, extensive dry crops will be raised.

42. The supply to the lands commanded by the Ghár Canal under the very best circumstances is insufficient; but the question is involved in that of the supply which can be obtained from the Sukkur Canal, and to a certain extent, as to what is to be done for the Western Nára upper and lower supply. The whole question is under enquiry, and will eventually come before Government when fully investigated.

43. *Western Nára.*—The remarks on this canal in the Ghár District only refer to the first 120 miles and the branches, which are in the Shikárpur Collectorate. It was opened in June, but did not get a good supply until the 20th July which only lasted until the 10th of September. A short cut was made from the Phulu Dhand at its head; but owing to the lowness of the inundation, the Dhand did not fill until late. Notwithstanding the bad inundation there was no falling off in the rice cultivation, and a general increase under all heads of 3,340 acres, and a considerable increased area of land was watered for rabi cultivation. A larger clearance than usual, costing Rs. 7,157, took place in the *Gul Mahomedwah*, one of the Nara branches; on this branch alone 3,175 acres increase occurred, and the Collector sold the occupancy rights of land to the amount of Rs. 15,000. The increase of cultivation, and the sum realized for occupancy rights were both directly due to the improved water-supply, but the revenue obtained for the occupancy rights is credited to land revenue, whereas without the improved supply of water in the canal, it would not have been worth one rupee. Many of the Sind canals could be thoroughly cleared and improved, if only the amounts received for the sale of occupancy rights were credited to them, and the return would pay cent. per-cent. on the expenditure.

44. *Wahurwah.*—Supply was about the same as the previous year, and requires a new mouth. The cultivation on it is 6,519 acres, or a decrease of 417 from last season.

45. *Marriwah* had a very good supply, and a cultivation of 3,689, or an increase of 127 acres over the previous year.

46. The crops throughout the Ghár Districts, which were above ground when the river rose to its full height in August, came to maturity in exceptionally good condition, and were considerably helped by unusual heavy dews in September. A large area of land was wetted for rabi during the height of the river. Sowings were continued very late as the water rose. Rice was sown as late as August, and jowári in September; considerable failure took place in these late crops.

47. The financial results for the year under report and four previous years are given in the following table:—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	11,30,274	3,04,277	3,23,305	26·9	28·6
1884-85	13,19,002	3,05,683	3,62,399	23·2	27·5
1885-86	10,37,602	3,06,686	3,63,637	29·6	35·0
1886-87	10,62,799	2,81,910	3,21,351	26·5	30·2
1887-88	10,49,490	2,94,952	3,18,534	28·10	30·4

The collection for the year, as compared with those of previous years, excepting one, has fallen off. This is due to reasons already noticed. The total charges against revenue are the least of all the years exhibited.

EASTERN NA'RA CANALS.

The full water-supply was admitted on the 14th of May through the Nára supply channel at Rohri. The Lallpir and Kadirpir floods fell into the Nára river at the 12th mile on the 26th of August, when the highest gauge reading was 21′ 8″ on the gauge at the regulator. A large area of land was watered for rabi, as compared with the previous year, on the channel itself. There was an increase of 779 acres of cultivation, and Rs. 1,904 of revenue. Owing to the low state of the Indus, the canals comprising the Eastern Nára system did not receive their full supply until the end of June, but after that, on the rise of the river, they received a full supply, which continued with favourable results to the end of the season. The area cultivated during the year and the assessed revenue on it was 168,148 acres and Rs. 3,15,802 respectively, which gives an increase over that of the previous year of Rs. 34,956 acres of cultivation, and Rs. 59,252 of revenue. It is plain that the prospects of the Nára valley are rapidly improving, as the cultivators see the improved state of things and the immunity from floods. When the extension to the Dimwah (now in hand) and Sarahalwah (pending sanction of Government) are completed and are working, and enhanced settlement rates are introduced, the Nára District will be one of the best cultivated and best paying districts in the province. There are still large tracts of good cultivable land in the Eastern Nára unprovided with water, which, as a supply can be found for them, will produce as good results as any of the lands already brought under irrigation.

49. *The Mithrao Canal* was opened at the usual time, but owing to the low state of the river the full supply could not be got into it until the end of June. The canal worked well afterwards. As compared with the previous year, the increase in the area of cultivation and revenue was 17,285 acres and Rs. 31,000 respectively.

50. *The Thar Canal* also suffered slightly from the low state of the Indus, but soon after water entered it in June, it worked well for the remainder of the

season. The increase of cultivation and revenue on this canal, as compared with the previous year, was 9,496 acres and Rs. 16,434 respectively.

51. On the *Dimwah* there was an increase of 302 acres of cultivation, and Rs. 327 of revenue; and on the Heranwah, an increase of 872 acres of cultivation, and Rs. 1,454 of revenue.

52. The reports on the detailed working of the canals in the Eastern Nára District to hand are rather meagre, but by the time this report is again due, it is hoped that fuller and more interesting information will be collected and given.

53. The financial results of the year and four previous ones are shown in the following table:—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	1,85,473	76,761	76,761	41·4	41·4
1884-85	2,21,625	86,216	86,216	38·9	38·9
1885-86	2,35,204	87,327	87,327	37·1	37·1
1886-87	2,75,293	91,036	91,036	33·06	33·06
1887-88	3,31,680	87,063	87,063	23·23	23·23

The collection for the year is the best of all the other four years, and compared with the previous one, the increase is Rs. 56,387. The increase from 1883-84 has been steady, and is likely to improve considerably. The charges against revenue show a decrease of Rs. 3,973, as compared with the previous year.

HYDERABAD CANALS.

54. The inundation was a bad one for this district as the canals are all below ground level and the water therefore lifted by wheel.

55. *The Mehrabwah* worked very well considering the lowness of the inundation. All the branches had water on the 15th of September, and the main canal flowed till the end of September. The crops were good. Floods from His Highness Mir Ali Murad's territory assisted the canals somewhat, and the Gharkno Bund was opened towards the end of September, and the supply which came in these enabled an extra watering to be given to the crops below it. There was an increase of cultivation of 874 acres and Rs. 2,071 of revenue, as compared with the previous year.

56. The *Nasrat* worked very well, and had a good supply. The new head, which was dug to it in the cold season, was the main cause of this. Four breaches occurred in the banks of this canal: three were closed without difficulty, but the fourth did considerable damage before it was closed, but wetted land for rabi cultivation. Some small breaches occurred on the branches of this canal, but did no damage of any importance. There was an increase of 1,160 acres of cultivation, and Rs. 2,884 of revenue, as compared with the previous year.

57. *The Naolakhi* also had a good supply, and its branches flowed well up to the middle of September. There was some want of water on the Bhur small and the tails of the Bag and Murad. No breaches occurred on the main canal, but there were a few small ones on the branches which did no damage. The result on this canal was an increase of 2,835 acres of cultivation, and Rs. 6,756 of revenue, as compared with the previous year.

58. *The Dambro* worked badly owing to the set of the river at the mouth of the Gharo which feeds it. Considerable erosion above its mouth and consequent silting up took place. Some of the silt was removed by the zamindárs, but this work did no good. The Wangi from Dadwah near Sehro flowed from 3rd June to 16th September, and gave a moderate supply to its branches in the

Moro Táluka. There was on this canal an increase of 256 acres of cultivation, and Rs. 575 of revenue, as compared with the previous year.

59. *The Dadwah* worked well, but its mouth was heavily silted through a change in the course of the river, which in 1886-87 cut away the low land lying outside the Gharo Dad, with the result that during the inundation of 1887, the canal was fed directly from the river. About 350 feet of the canal itself were eaten away. The branches of the canal were also much more silted than usual owing to the change in the river. The result was an increase of 2,014 acres of cultivation, and Rs. 2,808 of revenue.

60. The *Gharos* in the Sakrand Sub-division, which feed the Nasri Dhand, from which the *Renwah* derives its supply, did not work well, and the consequence was a deficiency of water in the early part of the season. The zamindárs did some clearance in one of the Gharos opposite Lakhat: but to very little effect, till the river rose. The smaller canals, taking off from the *Gharo Alibahr Myle*, also suffered more or less.

61. *The Renwah* and its branches worked unsatisfactorily in the early part of the season from the failure of the Gharos to feed the Nasri Dhand properly, as above noted. The result was a decrease of 4,195 acres of cultivation, and Rs. 6,499 of revenue, as compared with the previous year.

62. The *Marak and branches*, and *Gharo Rano* and branches, the *Sadarang* and *Dharyakhan* worked well, and there were few complaints; but the other canals in the Hala Sub-division—the *Alibahar Kacheri*, the *Sadang*, *Aliganj*, *Gharo Mahmuda*, *Sanghro*, *Alibahar Tando Adam*, and *Ghalu*—had a very poor supply in the early season, and did not work well till the second week in July, when the river rose. The crops suffered most on the branches of *Rein*, on the *Alibahar Kacheri*, the *Sarang* and *Aliganj*.

63. The result for the Marak was an increase of 587 acres of cultivation, and Rs. 1,971 of revenue, as compared with the previous year. The result on the Alibahr Kacheri was a decrease of 749 acres of cultivation and Rs. 1,092 of revenue. The result on the Gharo Mahmuda was an increase of 1,092 acres of cultivation and decrease of Rs. 4,541 of revenue: the result on the Kari Shumali was an increase of 299 acres of cultivation and Rs. 2,629 of revenue.

64. The cultivation in the Alehiar Ka Tando sub-division, dependent on the branches of the *Gharo Mahmuda* for water, suffered much in the early part of the season, owing to the lowness of the river. They did not get water in any quantity till about the 11th July. The crops however were fairly good.

65. The *Nasirwah and Sarfráz* worked as well as could be expected. They flowed for four months and some days, and though the supply was late, the crops were fairly good, except on some of the high level Kariahs, and tails of some of the branch canals. The result on the Nasirwah was an increase of 701 acres of cultivation, and Rs. 4,474 of revenue, and the result on the Sarfraz was a decrease of 1,437 acres of cultivation, and an increase of Rs. 391 of revenue. This is a very arbitrary result, but it is difficult to account for it.

66. The financial results of the canals in this district for the year under review and four previous years are given in the table below :—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue collection.	Percentage of Total Charges.
		Maintenance and Revenue collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	5,37,269	2,45,808	2,45,808	45·7	45·7
1884-85	6,35,855	2,37.841	2,51,853	37·4	39·6
1885-86	6,18,608	2,08,670	2,11,177	33·7	34·1
1886-87	6,27,340	2,33,164	2,33,164	37·1	37·1
1887-88	6,40,454	2,37,242	2,37,288	37·04	37·05

The collections in this district also show considerable improvement over those of preceding years, the increase being gradual and steady, as compared with the previous year: the increase is Rs. 13,114. The charges show a little increase, but they are due to increased amount for collection, and to increased expenditure on canal clearances.

FULELI CANALS.

67. *Fuleli Main Canal.*—The canal was opened on the 26th of April, but all water used for irrigation even from the main canal had to be raised by wheel up to the 10th of July.

68. The dry-crop canals in tálukás Hyderabad and Mobhat Dero were very poorly supplied; and the duration of the irrigation supply in them was under two months. In June the defects of the inundation was so apparent that special measures were adopted to rotate the supply on the main canal and branches, where for want of water, rice seed-beds were in danger of withering, and afterwards in September the same measures had to be adopted to save the growing crops of rice.

69. The greatest want of water was felt on the Suni Guni, down which water could only be forced by partially closing the regulator on the Aliwah large and Sherewah large. Even with the exertions made to fairly distribute the short supply, water was, with difficulty, delivered to lands situated on the tails of branch canals, and the cultivation there consequently suffered seriously. The results, notwithstanding the poor inundation, and difficulties in fairly distributing the water, are good. There was an increase of 21,383 acres of cultivation, and Rs. 51,736 of revenue, which is very creditable to the exertion used by the Executive Engineer and his establishment in distributing the water.

Remissions to the extent of Rs. 3,203 were given, and the whole of that sum seems to have been for blighted crops.

70. *Indus Canals.*—These canals are ten in number, and have separate heads from the Indus; they generally are troublesome to supply, and during a poor inundation, as a matter of course, are more difficult than ordinary.

71. The *Chandanwah* and its branches worked very badly owing to a sand-bank having formed in the Indus at its mouth. To obtain water early the cultivators themselves cut a channel through the sand-bank: but the supply lasted only 56 days in all.

72. The *Mulchand Canal* worked badly for a similar reason: but generally speaking the crops on all these canals were fair. They silted more than usual, which was only in accordance with a poor and fluctuating inundation. The result for the year on these canals, as compared with the previous year, was nevertheless good; the increase being 1,411 acres of cultivation, and Rs. 3,239 of revenue.

73. *River Embankments.*—The Hajipur Bund was considerably strengthened during the season 1886-87, and was not severely tested, as the water did not rise high against it. Two leaks occurred and were closed at once.

74. *Breaches.*—Four breaches occurred in the Fuleli branches in the Guni Táluka, and were at once closed. Only three occurred in Bago Tando Táluka, of which one only occurred from the canal bank, and 44 occurred from Fuleli branches in Badin Táluka. Fifteen breaches took place in the Indus canals, all of which were closed within 24 hours. It is remarkable that all these breaches occurred at heads of zamindári canals, and they were, no doubt, caused by the neglect of zamindárs and cultivators to keep in proper order the heads supplying their own water-courses. The Irrigation Act gives the Executive Engineer for Irrigation no powers to enforce repairs of heads to private water-courses, and personal persuasion, though often effectual, is not always sufficient in having this very necessary work properly done.

75. The financial results for the year and four preceding ones are given in the following table:—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	3,69,263	1,81,258	1,81,386	49·0	49·0
1884-85	4,17,606	2,32,754	2,32,754	55·7	55·7
1885-86	4,33,198	2,08,605	2,08,654	48·2	48·2
1886-87	5,07,009	2,14,374	2,14,374	42·2	42·2
1887-88	5,54,389	2,76,408	2,76,408	49.86	49·86

The improvement in the revenue collected in this district is even greater than the other districts, as from Rs. 3,69,263 in 1883-84 it has risen up to Rs. 5,54,389 in 1887-88. The increase compared with the previous year is Rs. 47,380. The charges have increased in the year of report, owing to increased amount for collection and increased expenditure on clearance.

KARA'CHI CANALS.

76. The low inundation of the year has had a very disastrous effect on the Western Nára Canal within this district, and the 3 tálukas of Dádú, Johi and Sehwan, chiefly depending on it for their water-supply, suffered severely. The average level in this canal was about 2½ feet below that necessary for a full supply to the present cultivation; and were it not for the command of water given by closing the Baid and Dian main sluices, the cultivation would have been a total failure. The main cause of this deficiency was the lowness of the river: but there is another cause also, more serious in its nature, and may be explained as follows:

77. The Western Nára, after a course of 120 miles through the Shikárpur Collectorate, enters the Dádú Táluka and flowing south through Dadú, Johi, and Sehwan for 40 miles, falls into the Manchar. For some years past, chiefly during the last three, the supply watering the Karáchi District has been gradually decreasing, owing principally to steadily increasing consumption in the Shikárpur District. This increased consumption of water in Shikárpur is not likely to be temporary, but the probability is that it will go on increasing with the result of still further diminishing the supply in the Karáchi District. In the 40 miles of the Nára in the Karáchi District there are 3 regulating sluices, by means and constant use of which the greatly reduced supply of late years has been distributed and divided, so as to give every one a share of the water available. The necessity of using these sluices to such an extent as required, which was never contemplated, has caused serious silting in the lower part of the Western Nára, and has of course deprived the Manchar lake of whatever assistance it used to get from this source. To remedy this state of things, a project has recently been submitted for the sanction of Government for excavating a new feeder to the Western Nára, through the northern part of the Dádú Táluka, so as to secure an ample supply for lands in the Karáchi District. Besides attaining this most desirable object, the proposed feeder will bring under cultivation large tracts of new land now lying waste for want of water. On the whole the project has much to recommend itself, and it is hoped that early sanction will be accorded to it. The Western Nára is a most important canal, and if it be left in its present state the result will be very disastrous both to Government and the people. The decrease of cultivation and revenue on this canal, as compared with the previous year, is 16,411 acres of cultivation and Rs. 34,454 of revenue. The decrease for the entire district is 8,208 acres of cultivation and Rs. 13,568 of revenue.

78. This lower portion of the Western Nara system, in the Karáchi Collectorate, is too outlying to be thoroughly looked after by the Executive Engineer, Karáchi, and as it is most desirable that the whole canal should be under one management, a recommendation to that effect has been made in the report

sent forward with the plans for improving the supply. The revenue on the whole canal, and Sehwan Sub-division is about 5¼ lákhs, and will fully pay for a separate and thorough supervision and management by a separate Engineer.

79. In the Shábbandar district the failure of the inundation was not so much felt; as the Piriyari, the principal canal, carries water at a high level, and is well under command. The whole of this district is liable to floods from the river, and there are still two gaps remaining in the line of protective embankments, for which plans and estimates have already been submitted for the sanction of Government. The damage done by overflow through these gaps was considerable, and there were also three breaches in the embankments which occurred late, and were closed with one exception, before any serious injury to the crops was done. Although considerable sums have been expended on these embankments during the last few years, their relative strength has not been much increased, *as the highest level of the river has been yearly rising and almost outstripping the improvements to the bunds.*

80. Considering the low inundation, all the canals in the Jerruck District worked well; of these the most important are the *Kalri* and *Baghar*. For the improvement of the former plans and estimates have been submitted, and when the works are carried out the irrigating capacity of the canal will be largely increased. The new mouth of the *Baghar* is still working well, and the supply in the canal has been thereby so largely increased, that the construction of embankments in many places is becoming necessary along its line. The line of river embankments in this district is now complete; and although there were several breaches, owing to the first rush of water on newly made earth, the danger from this will decrease as the works become consolidated, and the slopes are grass-grown. Both banks of the river are now protected from Jerruck to the commencement of the Delta proper (with the exception of the two gaps mentioned above).

81. The financial results for all the canals and bunds in this district for 1887-88 and four previous years are given below :—

Years.	Total Canal Revenue Collected.	Revenue Charges.		Percentage of maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
1883-84	4,75,488	2,88,032	3,63,771	60·5	76·5
1884-85	5,40,517	2,56,710	3,16,527	47·5	58·6
1885-86	5,41,894	2,59,772	3,29,127	47·9	60·7
1886-87	5,62,169	2,66,937	3,28,878	47·4	58·5
1887-88	5,44,789	3,64,498	4,37,489	66·80	80·30

There has been a falling off in this district of Rs. 17,371 in the revenue collected, as compared with the previous year: this is due to a decrease in the area cultivated and to a large amount outstanding at the end of the year. The charges have increased considerably owing to increased expenditure in canals and bunds of the district from the extra grant made available at the end of the year.

GEO. LAMBERT, M.Inst.C.E.,

Superintending Engineer for Irrigation in Sind.

Camp Tando Bago, 20th December 1888.

TABLE I.

Cultivation and Water-share of Net Consolidated Revenue for 1887-88 and three previous years.

Canals and Districts.	1884-85.		1885-86.		1886-87.		Average.		1887-88.	
	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
Begári Canals ... Desert Canal	74,409	1,29,157	53,125	93,469	39,583	65,311	55,701	95,979	50,107	89,722
Begári Canals ... Unharwah	...	...	11,831	21,389	24,322	43,773	12,051	21,721	29,406	53,155
Begári Canals ... Begári Canal	132,215	2,40,514	148,787	2,84,554	135,066	2,51,196	138,689	2,58,755	126,237	2,30,789
Begári Canals ... Kashmor Bund	3,984	7,158	5,872	10,812	5,269	9,952	5,042	9,207	3,840	6,958
Shikárpur Canals. Canals in Rohri	68,235	1,38,844	60,554	1,38,879	65,598	1,62,327	64,796	1,46,683	76,634	1,88,096
Shikárpur Canals. Bunds in Rohri	3,977	7,490	3,749	8,334	...	...	2,575	5,275	...	...
Shikárpur Canals. Sind Canal	46,221	1,18,644	49,642	1,33,824	53,025	1,46,036	49,629	1,32,835	48,912	1,34,377
Shikárpur Canals. Sukkur-Begári Bund	...	...	...	...	...	...	...	...	...	...
Ghár Canals ... Sukkur Canal	71,057	1,63,182	57,654	1,37,501	66,204	1,61,967	64,972	1,54,217	70,721	1,68,122
Ghár Canals ... Ghár Canal	212,574	6,71,131	168,982	4,81,083	170,360	4,79,818	183,929	5,44,011	162,960	4,56,605
Ghár Canals ... Nára	131,892	3,96,248	118,485	3,59,262	123,608	3,70,959	124,632	3,78,823	127,008	3,80,867
Ghár Canals ... Wáhur	8,766	20,946	7,001	17,140	6,936	16,671	7,568	18,252	6,519	16,847
Ghár Canals ... Marvi	3,744	10,005	3,709	9,892	3,816	10,021	3,756	9,773	3,089	9,503
Ghár Canals ... Bunds, right bank	80	156	46	80	87	147	74	128	113	175
Eastern Nára Canals. Nára Supply Channel	742	2,005	2,139	5,525	1,683	4,334	1,521	3,955	2,462	6,238
Eastern Nára Canals. Eastern Nára	10,093	20,555	12,168	18,281	18,438	26,704	13,568	21,847	24,760	34,837
Eastern Nára Canals. Mithrau Canal	73,092	1,52,484	78,202	1,46,411	87,707	1,74,587	79,667	1,51,161	104,992	2,05,587
Eastern Nára Canals. Thar Canal	23,176	44,451	25,282	42,291	22,389	45,918	23,616	44,220	31,785	62,352
Eastern Nára Canals. Dimwah	1,706	2,844	2,165	3,780	2,269	3,832	2,073	3,485	2,571	4,159
Eastern Nára Canals. Heranwah	586	818	557	902	703	1,175	615	965	1,575	2,629
Hyderabad Canals. Mehrabwah	10,092	10,684	12,743	23,746	11,858	21,110	11,564	21,513	12,782	23,181
Hyderabad Canals. Nasrat	16,276	39,933	16,103	38,806	17,607	41,876	16,662	40,205	18,767	44,760
Hyderabad Canals. Naolakhi	45,604	1,03,393	45,674	1,00,899	46,018	1,01,022	45,765	1,01,771	48,853	1,07,778
Hyderabad Canals. Dambro	5,106	11,652	5,968	12,884	6,872	14,597	6,002	13,044	7,128	15,172
Hyderabad Canals. Dad	17,233	36,694	17,874	36,074	20,637	43,011	18,581	38,893	22,651	45,819
Hyderabad Canals. Rein	13,516	26,774	17,444	33,246	19,193	35,834	16,784	31,951	14,998	29,335
Hyderabad Canals. Alibhar Kacheri	8,090	16,831	6,652	13,692	6,478	13,298	7,070	14,607	5,720	12,206
Hyderabad Canals. Márak	41,226	88,480	36,968	81,472	36,295	80,656	38,160	83,536	35,708	78,685
Hyderabad Canals. Gharo Mahmuda	52,408	98,437	49,318	91,948	49,115	86,741	25,075	92,375	45,023	91,282
Hyderabad Canals. Kari Shumáli	28,306	40,100	25,753	38,203	28,305	37,805	27,455	38,703	28,604	40,434
Hyderabad Canals. Nasir	25,269	48,419	24,226	42,843	25,730	43,401	25,075	44,887	26,431	47,875
Hyderabad Canals. Sarfraz	19,516	28,187	18,625	26,422	19,441	28,598	19,194	27,742	18,004	28,987
Hyderabad Canals. Other Canals	20,936	45,772	23,601	52,168	25,023	52,103	23,187	50,014	23,076	48,333
Fuleli Canals ... Fuleli	170,477	3,40,844	172,055	3,57,111	199,157	4,36,882	186,563	3,78,279	220,540	4,88,618
Fuleli Canals ... Other Canals	12,695	31,955	14,347	35,374	15,109	37,800	14,050	34,876	19,520	40,539
Karáchi Canals. Nára	73,187	1,64,445	71,165	1,53,830	72,368	1,62,905	72,240	1,60,393	55,957	1,28,451
Karáchi Canals. Phitta	5,424	10,592	4,950	9,248	4,872	9,642	5,082	9,817	5,282	10,130
Karáchi Canals. Canals north of Kotri	12,597	24,464	11,877	22,572	13,385	25,581	12,620	24,206	14,354	28,154
Karáchi Canals. Kulri	6,036	15,713	7,019	17,497	9,122	20,430	7,392	17,880	8,750	20,831
Karáchi Canals. Baghár	12,321	25,293	14,671	28,630	17,285	29,569	14,926	27,822	16,361	29,273
Karáchi Canals. Uchita	8,804	18,825	10,141	24,308	10,742	26,462	9,996	23,195	10,527	25,433
Karáchi Canals. Canals in Tata, &c.	7,471	15,800	8,945	17,011	9,502	17,515	8,639	16,775	7,566	12,289
Karáchi Canals. Shal Canals	2,115	5,542	3,377	8,113	2,814	6,878	2,769	6,844	2,793	7,107
Karáchi Canals. Pinyári	55,093	1,41,952	56,426	1,39,505	57,137	1,41,772	56,552	1,41,076	65,803	1,59,341
Karáchi Canals. Canals in Mirpur Batoro	9,193	23,849	9,763	22,742	10,068	24,409	9,675	23,667	10,845	27,385
Karáchi Canals. Canals in Sujáwal	7,135	17,006	6,721	15,490	7,028	16,410	6,961	16,302	6,478	14,042
Karáchi Canals. Satta	7,171	17,063	6,518	17,891	7,041	18,011	6,907	14,355	9,279	18,438
Karáchi Canals. Canals in Jati	1,774	4,396	1,217	3,456	1,288	3,268	1,426	3,707	2,233	5,554
Karáchi Canals. Khanta	5,207	9,602	5,092	8,932	5,000	9,545	5,100	9,360	5,222	12,480
Karáchi Canals. Kokawari	15,012	31,587	13,905	28,472	11,797	22,000	13,571	27,353	12,050	24,052
Karáchi Canals. Canals in Shahbandar	2,363	4,822	2,152	4,197	2,541	4,124	2,452	4,314	1,403	3,400
Karáchi Canals. Bunds, left bank	413	1,287	627	2,050	...	...	347	1,112	...	...
Karáchi Canals. Bunds, right bank	...	...	245	549	790	2,326	345	958	...	...
Begári Canals ...	210,608	3,76,829	219,615	4,10,224	204,225	3,69,082	211,483	3,85,662	200,590	3,80,624
Shikárpur Canals	118,433	2,64,978	113,945	2,81,037	118,023	3,08,363	117,000	2,84,793	125,546	3,22,473
Ghár Canals ...	428,122	12,61,608	355,807	10,14,958	377,011	10,39,583	384,480	11,05,403	371,010	10,31,110
Eastern Nára Canals...	109,490	2,03,157	120,603	2,17,190	133,189	2,56,550	121,094	2,25,636	168,145	3,15,802
Hyderabad Canals ...	303,638	6,04,356	300,939	5,93,203	309,572	6,00,052	304,718	5,99,237	307,704	6,13,347
Fuleli Canals ...	183,172	3,72,799	186,402	3,92,485	214,266	4,74,182	194,613	4,13,155	237,060	5,29,157
Karáchi Canals ...	232,816	5,32,583	235,411	5,23,903	242,780	5,40,837	237,002	5,32,471	234,572	5,27,209
Total ...	1,586,279	36,16,370	1,532,722	34,33,190	1,593,666	35,89,499	1,570,890	35,46,357	1,653,627	37,20,291

Note.—The figures in this statement are based on assessment.

TABLE II.

Area of Cultivation and Canal Revenue for 1887-88 and five previous years.

Years.	Cultivation. Government.	Cultivation. Jághir.	Cultivation. Total.	Water Share of net Consolidated Revenue.	Hakába.	Miscellaneous.	Total Canal Revenue.
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1882-83 ...	1,508,292	165,001	1,673,293	32,02,048	87,057	49,739	33,38,844
1883-84 ...	1,362,107	178,724	1,540,831	31,68,358	85,134	53,560	33,07,052
1884-85 ...	1,586,279	196,894	1,783,173	36,16,370	1,06,090	50,706	37,73,166
1885-86 ...	1,532,722	207,197	1,739,919	34,33,190	96,037	48,114	35,77,341
1886-87 ...	1,593,666	220,984	1,814,650	35,89,499	1,40,028	48,458	37,77,985
Average ...	1,516,615	193,760	1,710,375	34,01,893	1,02,869	50,116	35,54,878
1887-88 ...	1,653,627	217,487	1,871,114	37,20,291	1,12,503	45,290	38,78,084
Increase or Decrease ...	+137,012	+23,727	+160,739	+3,18,398	+9,634	—4,826	+3,23,206

Note.—The figures in this statement, with the exception of Hakába and Miscellaneous which are actual realizations, are based on assessment.

GEO. LAMBERT, M.Inst.C.E.,

Superintending Engineer for Irrigation in Sind.

TABLE III.

Area of Cultivation and Canal Revenue for 1887-88.

Canals, Executive Districts, and Collectorates.			Cultivation.			Water share of net consolidated Revenue as in Table VII.	Hakába.	Miscellaneous.	Total Canal Revenue.
			Government.	Jághir.	Total.				
			Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Frontier, Upper Sind.	Begári Canals	Desert Canal	50,107	38,445	88,552	89,722	36,742	229	1,26,693
		Unharwah	29,406	...	29,406	53,155	10	30	53,195
		Begári Canal	126,237	31,363	157,600	2,30,789	25,026	465	2,56,280
		Works for which no Capital Accounts are kept	3,840	...	3,840	6,958	...	223	7,181
Shikárpur Collectorate.	Shikárpur Canals.	Canals in Rohri	76,634	4,932	81,566	1,88,096	1,228	1,304	1,90,628
		Bunds in Rohri	...	...	...	...	...	1	1
		Sind Canal	48,912	4,109	53,021	1,34,377	1,738	364	1,36,479
		Sukkur-Begári Bund	...	...	...	...	...	392	392
		Works for which no Capital Accounts are kept	...	...	...	...	...	12	12
	Ghár Canals	Sukkur Canal	70,721	1,660	72,381	1,68,122	479	652	1,69,253
		Ghár do.	162,960	3,279	166,239	4,56,605	819	3,855	4,61,279
		Nára do.	127,008	8,962	135,970	3,80,867	2,897	2,943	3,86,707
		Wáhur do.	6,519	...	6,519	15,847	...	7	15,854
		Marvi do.	3,689	...	3,689	9,503	...	1,666	11,169
		Bunds, Right Bank	113	46	159	175	6	52	233
		Works for which no Capital Accounts are kept	...	...	...	...	...	16	16
Thar and Párkar.	Eastern Nára...	Nára Supply Channel	2,462	1,322	3,784	6,238	238	4,028	10,504
		Eastern Nára	24,760	...	24,760	34,837	...	9,963	44,800
		Mithrau Canal	104,992	...	104,992	2,05,587	...	992	2,06,579
		Thar Canal	31,785	1,314	33,099	62,352	581	187	63,120
		Dimwah	2,571	...	2,571	4,159	...	...	4,159
		Heranwah	1,575	...	1,575	2,629	...	...	2,629
		Works for which no Capital Accounts are kept	...	...	...	...	...	3	3
Hyderabad Collectorate.	Hyderabad Canals.	Mehrabwah	12,732	158	12,890	23,181	...	202	23,383
		Nasrat	18,767	629	19,396	44,760	225	184	45,169
		Naolakhi	48,853	2,877	51,730	1,07,778	596	368	1,08,742
		Dámbro	7,128	769	7,897	15,172	93	106	15,371
		Dad	22,651	5,838	28,489	45,819	1,486	254	47,559
		Rein	14,998	44	15,042	29,335	3	158	29,496
		Alibahr Kacheri	5,729	887	6,616	12,206	395	15	12,616
		Márak	35,708	5,410	41,118	78,685	1,895	308	80,888
		Gháro Mahmuda	45,023	12,338	57,361	91,282	4,307	524	96,113
		Kari Shumali	28,604	7,895	36,499	40,434	2,466	371	43,271
		Nasir	26,431	2,223	28,654	47,875	707	193	48,775
		Sarfráz	18,004	5,411	23,415	28,987	1,540	348	30,875
		Other Canals	23,076	2,124	25,200	48,333	766	276	49,375
		Works for which no Capital Accounts are kept	...	...	...	...	...	...	...
	Fuleli Canals...	Fuleli	220,540	56,626	277,166	4,88,618	18,924	4,637	5,12,179
		Other Canals	16,520	800	17,320	40,539	328	246	41,113
		Works for which no Capital Accounts are kept	...	...	...	...	...	...	...
Karáchi Collectorate.	Karách Canals.	Nára	55,957	8,658	64,615	1,28,451	5,373	5,826	1,39,650
		Phitta	5,282	524	5,806	10,130	416	344	10,890
		Canals north of Kotri	14,354	2,551	16,905	28,154	544	106	28,804
		Kalri	8,359	430	8,789	20,831	188	78	21,097
		Baghár	16,361	1,335	17,696	29,273	623	...	29,896
		Uchita	10,527	...	10,527	25,433	...	201	25,634
		Canals in Tatta, &c.	7,566	820	8,386	12,289	251	532	13,072
		Shal Canals	2,793	...	2,793	7,107	...	...	7,107
		Pinyári	65,803	1,906	67,709	1,59,341	811	1,347	1,61,499
		Canals in Mirpur Batoro	10,845	...	10,845	27,385	..	...	27,385
		Canals in Sujáwal	6,478	28	6,506	14,942	9	2	14,953
		Satta	9,279	323	9,602	18,438	213	...	18,651
		Other Canals in Jati	2,233	124	2,357	5,554	47	161	5,762
		Khanta	5,222	154	5,376	12,489	103	...	12,592
		Kokawari	12,050	...	12,050	24,952	...	803	24,855
		Other Canals in Shahbandar	1,463	236	1,699	3,400	105	316	3,821
		Bunds, left bank	...	540	540	...	181	...	181
		Bunds, right bank	...	397	397	...	144	...	144
		Works for which no Capital Accounts are kept	...	...	...	...	...	...	...
Begári Canals			209,590	69,808	279,398	3,80,624	61,778	947	4,43,349
Shikárpur Canals			125,546	9,041	134,587	3,22,473	2,966	2,073	3,27,512
Ghár Canals			371,010	13,947	384,957	10,31,119	4,201	9,191	10,44,511
Eastern Nára			168,145	2,636	170,781	3,15,802	819	15,173	3,31,794
Hyderabad Canals			307,704	46,603	354,307	6,13,847	14,479	3,307	6,31,633
Fuleli Canals			237,060	57,426	294,486	5,29,157	19,252	4,883	5,53,292
Karáchi Canals			234,572	18,026	252,598	5,27,269	9,008	9,716	5,45,993
		Total	1,653,627	217,487	1,871,114	37,20,291	1,12,503	45,290	38,78,084

Note.—The figures in this statement with the exception of Hakába and Miscellaneous are based in assessments.

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE IV.

Revenue Expenditure on New Works, Maintenance and Repairs and Revenue Collection Charges in the Civil Department for 1887-88.

Canals and Executive Districts.	Revenue Expenditure.								Total Revenue Expenditure.			
	Improvements.			Maintenance and Repairs.			Revenue Collection Charges in the Civil Department	Total.	Works.	Establishment.		Total.
	Works.	Establishment and Tools and Plant.	Total.	Works.	Establishment and Tools and Plant.	Total.				Public Works Department.	Civil Department.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals. — Desert Canal	...	...	...	30,713	9,700	40,413	9,175	49,588	30,713	9,700	9,175	49,588
Begári Canals. — Unharwah	...	...	...	9,001	2,538	11,539	5,321	16,860	9,001	2,538	5,321	16,860
Begári Canals. — Begári Canal	...	...	...	47,375	13,883	61,258	21,838	83,096	47,375	13,883	21,838	83,096
Begári Canals. — Kashmor Bund	46,013	9,383	55,396	38,717	7,896	46,613	696	47,309	84,730	17,279	696	1,02,705
Shikárpur Canals. — Canals in Rohri	1,947	525	2,472	47,742	12,866	60,608	18,947	79,555	49,689	13,391	18,947	82,027
Shikárpur Canals. — Bunds in Rohri	4,568	1,122	5,690	2,038	515	2,553	...	2,553	6,606	1,637	...	8,243
Shikárpur Canals. — Sind Canal	105	28	133	28,986	7,811	36,797	13,663	50,460	29,091	7,839	13,663	50,593
Shikárpur Canals. — Sukkur-Begári Bund	34,491	9,295	43,786	42,697	11,506	54,203	...	54,203	77,188	20,801	...	97,989
Ghár Canals. — Sukkur Canal	...	...	...	27,178	6,553	33,731	9,840	43,571	27,178	6,553	9,840	43,571
Ghár Canals. — Ghár	17,552	4,226	21,778	84,112	20,306	1,04,418	34,544	1,38,962	1,01,664	24,532	34,544	1,60,740
Ghár Canals. — Nára	...	...	...	44,784	10,781	55,565	38,542	94,107	44,784	10,781	38,542	94,107
Ghár Canals. — Wáhur	...	...	...	2,074	499	2,573	1,518	4,091	2,074	499	1,518	4,091
Ghár Canals. — Marvi	...	...	...	842	203	1,045	1,116	2,161	842	203	1,116	2,161
Ghár Canals. — Bunds, right bank	1,454	350	1,804	9,706	2,336	12,042	18	12,060	11,160	2,686	18	13,864
Eastern Nára Canals. — Nára Supply Channel	...	...	—	2,339	624	2,963	648	3,611	2,339	624	648	3,611
Eastern Nára Canals. — Eastern Nára	...	...	—	9,751	2,976	12,727	4,128	16,855	9,751	2,976	4,128	16,855
Eastern Nára Canals. — Mithrau Canal	...	...	...	15,121	11,456	26,577	20,560	47,137	15,121	11,456	20,560	47,137
Eastern Nára Canals. — Thar Canal	...	...	...	7,068	5,084	12,152	6,283	18,435	7,068	5,084	6,283	18,435
Eastern Nára Canals. — Dimwah	...	...	—	252	69	321	327	648	252	69	327	648
Eastern Nára Canals. — Heranwah	...	...	...	...	...	...	377	377	...	...	377	377
Hyderabad Canals. — Mehrabwah	...	...	...	5,457	1,413	6,870	2,318	9,188	5,457	1,413	2,318	9,188
Hyderabad Canals. — Nasrat	...	...	...	16,526	5,065	21,591	4,499	26,090	16,526	5,065	4,499	26,090
Hyderabad Canals. — Naolákhi	...	...	—	14,796	4,535	19,331	10,837	30,168	14,796	4,535	10,837	30,168
Hyderabad Canals. — Dámbro	...	...	...	6,430	1,972	8,402	1,526	9,928	6,430	1,972	1,526	9,928
Hyderabad Canals. — Dad	...	...	...	13,166	4,037	17,203	4,704	21,907	13,166	4,037	4,704	21,907
Hyderabad Canals. — Rein	...	...	...	10,389	3,185	13,574	2,934	16,508	10,389	3,185	2,934	16,508
Hyderabad Canals. — Alibhar Kacheri	...	—	...	4,364	1,129	5,493	475	5,968	4,364	1,129	475	5,968
Hyderabad Canals. — Márak	...	...	...	10,780	2,687	13,467	4,716	18,183	10,780	2,687	4,716	18,183
Hyderabad Canals. — Gharo Mahmuda	...	...	...	18,049	5,528	23,577	9,695	33,272	18,049	5,528	9,695	33,272
Hyderabad Canals. — Kari Shumáli	...	...	...	9,582	2,937	12,519	4,340	16,859	9,582	2,937	4,340	16,859
Hyderabad Canals. — Nasir	35	11	46	8,678	2,661	11,339	5,026	16,365	8,713	2,672	5,026	16,411
Hyderabad Canals. — Sarfraz	...	...	...	7,756	2,008	9,764	2,129	11,893	7,756	2,008	2,129	11,893
Hyderabad Canals. — Other Canals	...	...	—	13,013	3,989	17,002	4,911	21,913	13,013	3,989	4,911	21,913
Fuleli Canals. — Fuleli	...	...	..	1,72,942	37,164	2,10,106	37,743	2,47,849	1,72,942	37,164	37,743	2,47,849
Fuleli Canals. — Other Canals	...	...	...	20,035	4,344	24,379	4,180	28,559	20,035	4,344	4,180	28,559
Karáchi Canals. — Nára	1,666	329	1,995	23,850	4,682	28,532	14,111	42,643	25,516	5,011	14,111	44,638
Karáchi Canals. — Phitta	...	...	...	4,325	849	5,174	1,060	6,234	4,325	849	1,060	6,234
Karáchi Canals. — Canals, north of Kotri	944	185	1,129	10,558	2,073	12,631	2,949	15,580	11,502	2,258	2,949	16,709
Karáchi Canals. — Kalri	...	—	...	13,331	2,617	15,948	2,155	18,103	13,331	2,617	2,155	18,103
Karáchi Canals. — Baghár	...	...	...	13,448	2,640	16,088	2,997	19,085	13,448	2,640	2,997	19,085
Karáchi Canals. — Uchita	...	—	...	359	72	431	2,517	2,948	359	72	2,517	2,948
Karáchi Canals. — Canals in Tatta, &c.	...	...	...	8,456	1,660	10,116	1,441	11,557	8,456	1,660	1,441	11,557
Karáchi Canals. — Shal Canals	...	...	...	2,393	470	2,863	719	3,582	2,393	470	719	3,582
Karáchi Canals. — Pinyári	...	...	...	48,779	9,576	58,355	16,214	74,569	48,779	9,576	16,214	74,569
Karáchi Canals. — Canals in Mirpur Batoro	...	...	...	14,999	2,945	17,944	2,720	20,664	14,999	2,945	2,720	20,664
Karáchi Canals. — Canals in Sujáwal	...	...	...	2,775	545	3,320	1,495	4,815	2,775	545	1,495	4,815
Karáchi Canals. — Satta	...	...	...	7,814	1,534	9,348	1,708	11,056	7,814	1,534	1,708	11,056
Karáchi Canals. — Canals in Jati	...	...	...	1,920	371	2,291	575	2,866	1,920	371	575	2,866
Karáchi Canals. — Khanta	...	...	...	6,603	1,296	7,899	1,190	9,089	6,603	1,296	1,190	9,089
Karáchi Canals. — Kokawari	...	...	...	3,994	784	4,778	2,359	7,137	3,994	784	2,359	7,137
Karáchi Canals. — Canals in Shahbandar	...	...	...	5,853	1,149	7,002	354	7,356	5,853	1,149	354	7,356
Karáchi Canals. — Bunds, left bank	26,504	5,090	31,594	51,230	10,057	61,287	18	61,305	77,734	15,147	18	92,899
Karáchi Canals. — Bunds, right bank	30,687	5,916	36,603	38,355	7,540	45,895	14	45,909	69,042	13,456	14	82,512
Karáchi Canals. — Forest Sluices	1,454	216	1,670	...	...	...	...	...	1,454	216	...	1,670
Begári Canals	46,013	9,383	55,396	1,25,806	34,017	1,59,823	37,030	1,96,853	1,71,819	43,400	37,030	2,52,249
Shikárpur Canals	41,111	10,970	52,081	1,21,463	32,698	1,54,161	32,610	1,86,771	1,62,574	43,668	32,610	2,38,852
Ghár Canals	19,006	4,576	23,582	1,68,696	40,678	2,09,374	85,578	2,94,952	1,87,702	45,254	85,578	3,18,534
Eastern Nára Canals	...	...	—	34,531	20,209	54,740	32,323	87,063	34,531	20,209	32,323	87,063
Hyderabad Canals	35	11	46	1,38,986	41,146	1,80,132	58,110	2,38,242	1,39,021	41,157	58,110	2,38,288
Fuleli Canals	...	...	...	1,92,977	41,508	2,34,485	41,923	2,76,408	1,92,977	41,508	41,923	2,76,408
Karáchi Canals	61,255	11,736	72,991	2,59,042	50,860	3,09,902	54,596	3,64,498	3,20,297	62,596	54,596	4,37,489
Total	1,67,420	36,676	2,04,096	10,41,501	2,61,116	13,02,617	3,42,170	16,44,787	12,08,921	2,97,792	3,42,170	18,48,883

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE V.

Cultivation, Canal Revenue and Expenditure for 1887-88 as contrasted with three previous years.

	Canals and Executive District.	Average of three previous years.			Percentage of Expenditure on Revenue.	Cost of Maintenance per acre.	1887-88.			Percentage of Expenditure on Revenue.	Cost of Maintenance per acre.	Length in miles of	
		Cultivated.	Canal Revenue.	Maintenance and Revenue Collections.			Cultivation.	Canal Revenue.	Maintenance and Revenue Collection.			Canal.	Bund.
		Acres.	Rs.	Rs.			Acres.	Rs.	Rs.				
Begári Canals.	Desert Canal	89,698	1,25,172	43,324	34·61	0·5	88,552	1,26,693	49,588	39·14	0·6	115	...
	Unharwah	12,051	21,731	8,408	38·69	0·7	29,406	53,195	16,860	31·69	0·6	67	...
	Begári Canal	176,379	2,95,861	77,743	26·28	0·4	157,600	2,56,280	83,096	12·91	0·2	176	...
	Kashmor Bund... ...	5,037	9,316	47,228	...	...	3,840	7,181	47,309	...	...	...	48
Shikárpur Canals.	Canals in Rohri ...	68,584	1,49,513	57,071	38·17	0·8	81,566	1,90,628	79,555	41·73	0·10	240	...
	Bunds in Rohri ...	2,575	5,378	5,161	...	...	...	1	2,553	...	...	...	54
	Sind Canal	54,182	1,35,452	34,484	25·46	0·6	53,021	1,36,479	50,460	36·97	0·10	98	..
	Sukkur-Begári Bund ...	...	4,936	43,744	...	...	...	392	54,203	...	...	...	36
Ghár Canals.	Sukkur Canal	66,370	1,55,784	34,215	21·96	0·5	72,381	1,69,253	43,571	25·74	0·6	127	...
	Ghár	189,431	5,50,338	1,45,015	26·35	0·8	166,239	4,61,279	1,38,962	30·13	0·8	381	...
	Nára	133,071	3,86,329	98,054	25·38	0·7	135,970	3,86,707	94,107	24·34	0·7	238	...
	Wáhur	7,568	19,014	3,952	20·78	0·5	6,519	15,854	4,091	25·80	0·6	23	...
	Marvi	3,750	10,856	2,738	25·22	0·7	3,689	11,169	2,161	19·34	0·6	15	...
	Bunds, right bank ...	109	178	14,123	...	...	159	223	12,060	...	...	...	112
Eastern Nára Canals.	Nára Supply Channel ...	2,427	8,159	5,690	69·74	2·3	3,784	10,504	3,611	34·38	0·10	12	...
	Eastern Nára	13,568	34,155	14,633	42·84	1·0	24,760	44,800	16,855	37·62	0·7	20	111
	Mithrau Canal	79,697	1,52,247	44,370	29·14	0·6	104,992	2,06,579	47,137	25·27	0·5	155	92
	Thar Canal	24,675	44,895	22,117	49·26	0·9	33,099	63,120	18,435	29·20	0·6	59	33
	Dimwah	2,077	3,489	1,348	38·49	0·6	2,571	4,159	648	15·58	0·3	18	...
	Heranwah	615	965	139	14·40	0·2	1,575	2,629	377	14·34	0·2	3	...
Hyderabad Canals.	Mehrabwah	11,621	21,598	13,856	64·15	1·2	12,890	23,383	9,188	39·29	0·7	59	...
	Nasrat	17,212	40,789	15,140	37·12	0·9	19,396	45,169	26,090	57·76	1·3	66	...
	Naolaki	48,368	1,02,882	29,211	28·39	0·6	51,730	1,08,742	30,168	18·55	0·4	137	...
	Dámbro	6,352	13,193	8,536	64·70	1·3	7,897	15,371	9,928	64·58	1·3	56	...
	Dad	23,191	40,851	17,384	42·55	0·7	28,489	47,559	21,907	43·96	0·7	105	...
	Rein	16,780	32,162	17,338	53·90	1·0	15,042	29,496	16,508	55·97	1·1	134	...
	Alibhar Kacheri ...	8,235	14,909	7,374	49·46	0·8	6,616	12,676	5,968	47·29	0·9	56	...
	Márak	43,986	85,869	16,828	19·59	0·4	41,118	80,888	18,183	22·48	0·4	194	...
	Gharo Mahmuda ...	61,819	97,423	34,317	35·22	0·6	57,361	96,113	33,272	24·21	0·4	291	...
	Kari Shumáli	36,382	41,657	16,581	39·80	0·4	36,499	43,271	16,859	38·96	0·5	214	...
	Nasir	26,783	45,833	19,159	41·80	0·7	28,654	48,775	16,365	32·73	0·6	130	...
	Sarfraz	23,998	28,874	12,938	44·80	0·5	23,415	30,875	11,893	38·52	0·5	116	...
	Other Canals	25,127	50,966	17,895	35·11	0·7	25,200	49,375	21,913	44·38	0·9	112	...
Fuleli Canals.	Fuleli	228,140	4,01,116	1,92,726	48·05	0·8	277,166	5,12,179	2,47,849	48·83	0·9	994	...
	Other Canals	14,810	55,369	32,534	91·98	2·2	17,320	41,113	28,559	69·46	1·6	153	8
Karáchi Canals.	Nára	80,435	1,66,338	25,868	15·55	0·3	64,615	1,39,650	42,643	30·53	0·7	112	...
	Phitta	6,001	10,295	5,088	49·42	0·8	5,806	10,890	6,234	57·25	1·0	27	...
	Canals north of Kotri...	18,029	24,897	13,914	55·88	0·8	16,905	28,804	15,580	54·09	0·9	58	...
	Kalri	7,737	18,223	12,068	66·22	1·5	8,789	21,097	18,103	85·80	2·05	136	...
	Baghár	18,199	28,443	13,386	47·06	0·7	17,696	29,896	19,085	63·84	1·08	106	...
	Uchita	9,996	23,312	2,525	10·83	0·3	10,527	25,634	2,948	11·11	0·3	44	...
	Canals in Tatta, &c. ...	9,463	18,245	7,221	39·58	0·8	8,386	13,072	11,557	88·41	1·4	83	...
	Shal Canals	2,769	6,844	6,017	87·91	2·2	2,793	7,107	3,582	50·40	1·3	18	...
	Pinyári	58,339	1,44,051	63,962	44·40	1·1	67,709	1,61,499	74,569	46·17	1·1	328	...
	Canals in Mirpur Batoro	9,675	23,669	11,804	49·87	1·2	10,845	27,385	20,664	75·46	1·9	81	...
	Canals in Sujáwal ...	7,026	16,316	4,805	29·45	0·7	6,506	14,953	4,815	32·87	0·7	35	...
	Satta	7,197	17,775	8,068	45·39	1·1	9,602	18,651	11,056	59·28	1·2	58	...
	Canals in Jati	1,551	3,764	1,369	36·37	0·9	2,537	5,762	2,866	49·74	1·1	11	...
	Khanta	5,392	9,440	9,313	98·65	1·7	5,376	12,592	9,089	72·18	1·7	59	...
	Kokawari	13,905	27,839	6,478	23·27	0·5	12,050	24,855	7,137	28·71	0·6	100	...
	Canals in Sháhbandar...	2,677	4,538	4,510	99·38	1·7	1,699	3,821	7,356	192·52	4·3	7	...
	Bunds, left bank ...	1,069	1,228	42,815	...	...	540	181	61,305	...	...	...	65
	Bunds, right bank ...	680	1,122	13,843	...	...	397	144	45,909	...	...	...	50
	Begári Canals	283,170	4,52,080	1,76,703	39·08	0·6	279,398	4,43,126	1,96,853	44·42	0·7	358	48
	Shikárpur Canals	125,343	2,91,179	1,40,459	48·23	1·1	134,587	3,27,500	1,86,771	57·03	1·4	338	90
	Ghár Canals	400,444	11,12,267	2,98,093	26·80	0·7	384,957	10,44,495	2,94,952	28·24	0·8	784	112
	Eastern Nára Canals	123,059	2,43,790	88,193	32·09	0·7	170,781	3,31,791	87,063	26·24	0·5	267	236
	Hyderabad Canals	349,821	6,16,927	2,26,558	36·73	0·6	354,307	6,31,633	2,38,242	37·56	0·7	1,670	1
	Fuleli Canals	242,949	4,36,486	2,18,594	50·08	0·9	294,486	5,53,292	2,76,408	49·96	0·9	1,147	8
	Karáchi Canals...	254,461	3,46,391	2,61,140	47·79	1·0	252,598	5,45,993	3,64,498	66·75	1·4	1,263	115
	Total ...	1,779,247	36,99,120	14,09,740	38·11	0·8	1,871,114	38,77,830	16,44,787	42·38	0·9	5,827	610
								254					
								38,78,084					

NOTE.—The figures of Canal revenue include Hakába and miscellaneous receipts which are actual realizations; the difference is based on assessments.

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE VI.

Direct and Indirect Receipts of Canal Revenue for 1887-88.

Canals and Districts.		Water Share of net consolidated Revenue as in Table VII.	Deduct average before improvement.	Balance Irrigation Share due to Canals.	Direct Receipts Hakába and Miscellaneous.	Difference of Assessment on Jághir Lands.	Total Direct and Indirect Receipts.
1		2	3	4	5	6	7
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals ...	Desert Canal...	89,722	.....	89,722	36,971	30,893	1,57,586
	Unharwah	53,155	.....	53,155	40	.....	53,195
	Begári Canal	2,30,789	24,856	2,05,933	25,491	34,085	2,65,509
	Kashmor Bund	6,958	.....	6,958	223	.....	7,181
Shikárpur Canals ...	Canals in Rohri	1,88,096	.....	1,88,096	2,532	13,512	2,04,140
	Bunds in Rohri	.....	.....	.....	1	.....	1
	Sind Canal	1,34,377	.....	1,34,377	2,102	11,923	1,48,402
	Sukkur-Begári Bund ...	.....	.....	.....	392	.....	392
Ghár Canals	Sukkur Canal	1,68,122	71,550	96,572	1,131	4,471	1,02,174
	Ghár	4,56,605	1,16,832	3,39,773	4,674	9,835	3,54,282
	Nára	3,80,867	.....	3,80,867	5,840	25,685	4,12,392
	Wáhur	15,847	.....	15,847	7	.....	15,854
	Marvi	9,503	.....	9,503	1,666	.....	11,169
	Bunds, right bank	175	.....	175	58	130	363
Eastern Nára... ...	Nára Supply Channel ...	6,238	.....	6,238	4,266	3,588	14,092
	Eastern Nára	34,837	3,444	31,393	9,963	.....	41,356
	Mithrau	2,05,587	.....	2,05,587	992	.....	2,06,579
	Thar Canal	62,352	.....	62,352	768	2,184	65,304
	Dimwah	4,159	.....	4,159	.....	.....	4,159
	Heranwah	2,629	.....	2,629	.....	.....	2,629
Hyderabad Canals ...	Mehrabwah	23,181	.....	23,181	202	431	23,814
	Nasrat	44,760	.....	44,760	409	1,602	46,771
	Naolaki	1,07,778	.....	1,07,778	964	6,204	1,14,946
	Dámbro	15,172	.....	15,172	199	1,648	17,019
	Dad	45,819	.....	45,819	1,740	11,016	58,575
	Rein	29,335	.....	29,335	161	89	29,585
	Alibhar Kacheri	12,206	8,427	3,779	410	1,819	6,008
	Márak...	78,685	36,459	42,226	2,203	12,026	56,455
	Gháro Mahmuda	91,282	.....	91,282	4,831	27,006	1,23,119
	Kari Shumali...	40,434	.....	40,434	2,837	12,414	55,685
	Nasir	47,875	.....	47,875	900	4,991	53,766
	Sarfraz	28,987	11,155	17,832	1,888	9,089	28,809
	Other Canals	48,333	.....	48,333	1,042	4,317	53,692
Fuleli Canals... ...	Fuleli Canal	4,88,618	1,30,284	3,58,334	23,561	1,35,515	5,17,410
	Other Canals	40,539	.....	40,539	574	2,076	43,189
Karáchi Canals ...	Nára	1,28,451	.....	1,28,451	11,199	14,137	1,53,787
	Phitta...	10,130	.....	10,130	760	935	11,825
	Canals north of Kotri ...	28,154	.....	28,154	650	4,657	33,461
	Kalri	20,831	.....	20,831	266	928	22,025
	Baghár	29,273	.....	29,273	623	2,945	32,841
	Uchita	25,433	.....	25,433	201	.....	25,634
	Canals in Tatta, &c. ...	12,289	.....	12,289	783	1,348	14,420
	Shal Canals	7,107	.....	7,107	.....	.....	7,107
	Pinyári	1,59,341	.....	1,59,341	2,158	4,675	1,66,174
	Canals in Mirpur Batoro ...	27,385	.....	27,385	.....	.....	27,351
	Canals in Sujáwal	14,942	.....	14,942	11	65	15,018
	Satta	18,438	.....	18,438	213	810	19,461
	Canals in Jati	5,554	.....	5,554	208	325	6,087
	Khanta	12,489	.....	12,489	103	391	12,983
	Kokowari	24,052	.....	24,052	803	.....	24,855
	Canals in Sháhbandar ...	3,400	.....	3,400	421	486	4,307
	Bunds, left bank	.....	.....	.....	181	1,578	1,759
	Bunds, right bank	.....	.....	.....	144	1,001	1,145
Begári Canals		3,80,624	24,856	3,55,768	62,502	64,978	4,83,248
Shikárpur Canals		3,22,473	.....	3,22,473	5,027	25,435	3,52,935
Ghár Canals		10,31,119	1,88,382	8,42,737	13,376	40,121	8,96,234
Eastern Nára Canals		3,15,802	3,444	3,12,558	15,989	5,772	3,34,119
Hyderabad Canals		6,13,847	56,041	5,57,806	17,786	92,652	6,68,244
Fuleli Canals		5,29,157	1,30,284	3,98,873	24,135	1,37,591	5,60,599
Karáchi Canals		5,27,269	.....	5,27,269	18,724	34,281	5,80,274
	Total ..	37,20,291	4,03,007	33,17,284	1,57,539	4,00,830	38,75,653
	Add—Agricultural Receipts ...				254	.....	254
	Total ...				1,57,793	.....	38,75,907

Note.—The figures in this statement, with the exception of Hakába and miscellaneous receipts, are based on assessments.

GEO. LAMBERT, M.Inst,C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE VI A.

Actual Direct and Indirect Receipts of Canal Revenue in 1887-88 as shown in General Revenue Accounts of Executive Districts prepared by the Examiner, Public Works Accounts.

Canals and Districts.		Water Share of net Consolidated Revenue collected.	Deduct average before improvement.	Balance Irrigation Share due to Canals.	Direct Receipts Hakába and Miscellaneous.	Difference of Assessment on Jághir Lands.	Total Direct and Indirect Receipts.
1		2	3	4	5	6	7
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	Desert Canal	91,709	.....	91,709	36,971	30,893	1,59,573
	Unharwah	53,206	.....	53,206	40	.....	53,246
	Begári Canal	2,40,604	24,856	2,15,748	25,491	34,085	2,75,324
	Kashmor Bund	6,958	.....	6,958	.....	.....	6,958
Shikárpur Canals	Canals in Rohri	1,88,188	.....	1,88,188	2,532	13,512	2,04,232
	Bunds in Rohri	.....	.....	.....	1	.....	1
	Sind Canal	1,34,867	.....	1,34,867	2,102	11,923	1,48,892
	Sukkur-Begári Bund	.....	.....	.....	392	.....	392
Ghár Canals	Sukkur Canal	1,69,444	71,550	97,894	1,131	4,471	1,03,496
	Ghár	4,59,614	1,16,832	3,42,782	4,674	9,835	3,57,291
	Nára	3,81,531	.....	3,81,531	5,840	25,685	4,13,056
	Wáhur	15,847	.....	15,847	7	.....	15,854
	Márvi	9,503	.....	9,503	1,666	.....	11,169
	Bunds, right bank	175	.....	175	58	130	363
Eastern Nára	Nára Supply Channel	6,238	.....	6,238	4,266	3,588	14,092
	Eastern Nára	34,827	3,444	31,383	9,963	.....	41,346
	Mithrau Canal	2,05,587	.....	2,05,587	992	.....	2,06,579
	Thar Canal	62,251	.....	62,251	768	2,184	65,203
	Dimwah	4,159	.....	4,159	.....	.....	4,159
	Heranwah	2,629	.....	2,629	.....	.....	2,629
Hyderabad	Mehrabwah	23,181	.....	23,181	202	431	23,814
	Nasrat	44,760	.....	44,760	409	1,602	46,771
	Naolaki	1,07,778	.....	1,07,778	964	6,204	1,14,946
	Dámbro	15,172	.....	15,172	199	1,648	17,019
	Dad	45,819	.....	45,819	1,740	11,016	58,575
	Rein	29,335	.....	29,335	161	89	29,585
	Alibhar Kacheri	12,536	8,427	4,109	410	1,819	6,338
	Marak	81,723	36,459	45,264	2,203	12,026	59,493
	Gháro Mahmuda	92,636	.....	92,636	4,831	27,006	1,24,473
	Kari Shumali	40,931	.....	40,931	2,837	12,414	56,182
	Nasir	49,558	.....	49,558	900	4,991	55,449
	Sarfraz	30,906	11,155	19,751	1,888	9,089	30,728
	Other Canals	48,333	.....	48,333	1,042	4,317	53,692
Fuleli Canals	Fuleli	4,88,786	1,30,284	3,58,502	23,561	1,35,515	5,17,578
	Other Canals	41,468	.....	41,468	574	2,076	44,118
Karáchi Canals	Nára	1,29,911	.....	1,29,911	11,199	14,137	1,55,247
	Phitta	10,129	.....	10,129	760	935	11,824
	Canals north of Kotri	28,844	.....	28,844	650	4,657	34,151
	Kalri	21,280	.....	21,280	266	928	22,474
	Baghár	29,351	.....	29,351	623	2,945	32,919
	Uchita	24,966	.....	24,966	201	.....	25,167
	Canals in Tatta, &c.	12,624	.....	12,624	783	1,348	14,755
	Shal Canals	7,195	.....	7,195	.....	.....	7,195
	Pinyári	1,59,413	.....	1,59,413	2,158	4,675	1,66,246
	Canals in Mirpur Batoro	27,203	.....	27,203	.....	.....	27,203
	Canals in Sujáwal	14,942	.....	14,942	11	65	15,018
	Satta	16,868	.....	16,868	213	810	17,891
	Canals in Jati	5,543	.....	5,543	208	325	6,076
	Khanta	11,794	.....	11,794	103	391	12,288
	Kokawari	22,785	.....	22,785	803	.....	23,588
	Canals in Sháhbander	3,226	.....	3,226	421	486	4,133
	Bunds, left bank	.....	.....	.....	181	1,578	1,759
	Bunds, right bank	.....	.....	.....	144	1,001	1,145
Begári Canals		3,92,477	24,856	3,67,621	62,502	64,978	4,95,101
Shikárpur Canals		3,23,055	.....	3,23,055	5,027	25,435	3,53,517
Ghár Canals		10,36,114	1,88,382	8,47,732	13,376	40,121	9,01,229
Eastern Nára Canals		3,15,691	3,444	3,12,247	15,989	5,772	3,34,008
Hyderabad Canals		6,22,668	56,041	5,66,627	17,786	92,052	6,77,065
Fuleli Canals		5,30,254	1,30,284	3,99,970	24,135	1,37,591	5,61,696
Karáchi Canals		5,26,074	.....	5,26,074	18,724	34,281	5,79,079
	Total	37,46,333	4,03,007	33,43,326	1,57,539	4,00,830	39,01,695
	Add Agricultural Receipts				254	.....	254
	Total				1,57,793	.....	39,01,949

Note.—The figures in this statement are based on actual realizations.

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE VII.

Area of Cultivation and Consolidated Revenue for 1887-88.

Canals and Districts.	Cultivation.			Consolidated Revenue.			Remissions.			Net Consolidated Revenue.	Land Share, 10 per cent.	Water Share, 90 per cent.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.			
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals.												
Desert Canal	47,059	3,048	50,107	94,007	5,749	99,756	65	...	65	99,691	9,969	89,722
Unharwah	27,504	1,902	29,406	55,167	3,894	59,061	...	...	...	59,061	5,906	53,155
Begári Canal	120,472	5,765	126,237	2,55,305	14,094	2,69,399	5,782	7,185	12,967	2,56,432	25,643	2,30,789
Kashmor Bund	1,132	2,708	3,840	2,311	5,420	7,731	..	...	...	7,731	773	6,958
Shikárpur Canals.												
Canals in Rohri... ...	52,979	23,655	76,634	1,38,033	71,015	2,09,048	54	...	54	2,08,994	20,898	1,88,096
Bunds in Rohri... ...	...	...	...	...	...	...	...	...	...	...	...	...
Sind Canal ...	44,481	4,431	48,912	1,34,361	14,994	1,49,355	47	...	47	1,49,308	14,931	1,34,377
Sukkur-Begári Bund ...	...	...	...	...	...	...	...	...	...	..	...	...
Ghár Canals.												
Sukkur Canal	55,188	15,533	70,721	1,43,805	46,767	1,90,572	2,264	1,506	3,770	1,86,802	18,680	1,68,122
Ghár	148,768	14,192	162,960	4,79,561	45,394	5,24,955	17,386	231	17,617	5,07,338	50,733	4,56,605
Nára	104,712	22,296	127,008	3,49,283	73,902	4,23,185	...	...	...	4,23,185	42,318	3,80,867
Wáhur	5,386	1,133	6,519	14,622	2,986	17,608	...	...	...	17,608	1,761	15,847
Marvi	2,579	1,110	3,689	6,488	4,070	10,558	...	...	...	10,558	1,055	9,503
Bunds, right bank ...	63	50	113	101	93	194	...	..	...	194	19	175
Eastern Nára Canals												
Nára Supply Channel ...	564	1,898	2,462	1,790	5,141	6,931	...	...	...	6,931	693	6,238
Eastern Nára	16,626	8,134	24,760	24,891	13,817	38,708	...	...	...	38,708	3,871	34,837
Mithrau Canal	83,076	21,916	104,992	1,86,849	41,758	2,28,607	177	...	177	2,28,430	22,843	2.05,587
Thar Canal	24,010	7,775	31,785	56,944	12,336	69,280	...	...	...	69,280	6,928	62,352
Dimwah	2,475	96	2,571	4,495	126	4,621	...	...	...	4,621	462	4,159
Heranwah	1,446	129	1,575	2,661	260	2,921	...	...	...	2,921	292	2,629
Hyderabad Canals.												
Mehrabwah	12,401	331	12,732	25,364	393	25,757	...	.	...	25,757	2,576	23,181
Nasrat	16,205	2,562	18,767	44,317	5,871	50,188	455	...	455	49,733	4,973	44,760
Naolakhi	44,627	4,226	48,853	1,10,248	9,505	1,19,753	..	...	...	1,19,753	11,975	1,07,778
Dámbro	6,459	669	7,128	15,296	1,562	16,858	...	...	...	16,858	1,686	15,172
Dad	21,064	1,587	22.651	46,512	4,403	50,915	...	5	5	50,910	5,091	45,819
Rein	14,370	628	14,998	31,131	1,554	32,685	91	...	91	32,594	3,259	29,335
Alibhar Kacheri ...	5,642	87	5,729	13,349	213	13,562	...	...	...	13,562	1,356	12,206
Márak	35,260	448	35,708	86,697	731	87,428	...	...	...	87,428	8,743	78,685
Gharo Mahmuda ...	42,327	2,696	45,023	96,753	5,027	1,01,780	356	...	356	1,01,424	10,142	91,282
Kari Shumáli	28,007	597	28,604	44,368	1,474	45,842	915	...	915	44,927	4,493	40,434
Nasir	25,323	1,108	26,431	51,411	2,238	53,649	454	...	454	53.195	5,320	47,875
Sarfraz	17,287	717	18,004	30,200	2,074	32,274	66	...	66	32,208	3,221	28,987
Other Canals	19,551	3,525	23,076	45,993	8,399	54,392	689	..	689	53,703	5,370	48,333
Fuleli Canals.												
Fuleli	194,611	25,929	220,540	4,95,248	50,863	5,46,111	3,203	...	3,203	5,42,908	54,290	4,88,618
Other Canals	15,683	837	16,520	42,658	2,385	45,043	...	...	...	45,043	4,504	40,539
Karáchi Canals.												
Nára	36,289	19,668	55,957	93,750	53,146	1,46,896	4,091	82	4,173	1,42,723	14,272	1,28,451
Phitta	3,703	1,579	5,282	7,673	3,582	11,255	...	...	...	11,255	1,125	10,130
Canals north of Kotri ..	11,727	2,627	14,354	25,196	6,086	31,282	...	...	...	31,282	3,128	28,154
Kalri	7,712	647	8,359	21,044	2,405	23,449	303	...	303	23,146	2,315	20,831
Baghár	13,403	2,958	16,361	27,949	6,464	34,413	1,887	...	1,887	32,526	3,253	29,273
Uchita	9,704	823	10,527	28,687	1,492	30,179	1,771	149	1,920	28,259	2,826	25,433
Canals in Tatta... ..	6,620	946	7,566	14,886	2,553	17,439	3,785	...	3,785	13,654	1,365	12,289
Shal Canals	2,450	343	2,793	6,937	960	7,897	...	...	...	7,897	790	7,107
Pinyári	63,691	2,112	65,803	1,74,715	5,995	1,80,710	3,665	...	3,665	1,77,045	17,704	1,59,341
Canals in Mirpur Batoro.	10,210	635	10,845	29,168	1,610	30,778	350	...	350	30,428	3,043	27,385
Canals in Sujáwal ...	5,866	612	6,478	15,873	1,631	17,504	902	...	902	16,602	1,660	14,942
Satta	9,149	130	9,279	21,044	528	21,572	1,083	2	1,085	20,487	2,049	18,438
Canals in Jati	1,966	267	2,233	5,549	622	6,171	...	...	...	6,171	617	5,554
Khanta	5,156	66	5,222	13,550	340	13,890	13	...	13	13,877	1,388	12,489
Kokawari	11,805	245	12,050	28,597	1,020	29,617	2,892	...	2.892	26,725	2,673	24,052
Canals in Shahbandar...	1,428	35	1,463	3,680	129	3,809	31	...	31	3,778	378	3,400
Bunds, left bank ...	...	...	...	...	...	...	...	...	...	...	...	...
Bunds, right bank ...	...	...	...	...	...	...	...	...	...	...	...	...
Begári Canals	196,167	13,423	209,590	4,06,790	29,157	4,35,947	5,847	7,185	13,032	4,22,915	42,291	3,80,624
Shikárpur Canals	97,460	28,086	125,546	2,72,394	86,009	3,58,403	101	...	101	3,58,302	35,829	3,22,473
Ghár Canals	316,696	54,314	371,010	9,93,860	1,73,212	11,67,072	19,650	1,737	21,387	11,45,685	1,14,566	10,31,119
Eastern Nára Canals	128,197	39,948	168,145	2,77,630	73,438	3,51,068	177	...	177	3,50,891	35,089	3,15,802
Hyderabad Canals	288,523	19,181	307,704	6,41,639	43,444	6,85,083	3,026	5	3,031	6,82,052	68,205	6,13,847
Fuleli Canals	210,294	26,766	237,060	5,37,906	53,248	5,91,154	3,203	...	3,203	5,87,951	58,794	5,29,157
Karáchi Canals	200,879	33,693	234,572	5,18,298	88,563	6,06,861	20,773	233	21,006	5,85,855	58,586	5,27,269
Total	1,438,216	215,411	1,653,627	36,48,517	5,47,071	41,95,588	52,777	9,160	61,937	41,33,651	4,13,360	37,20,291

Note—The figures in this Statement are based on assessments.

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE VIII.

Discharges of certain Canals, Areas of Crops of different kinds irrigated, and Duty of Water per cubic foot of supply for Kharif Season 1887.

Canals and Executive Charges.			Average Discharge per cubic foot per second.	Areas of Land irrigated.				Area of Land Irrigated.		Total Area irrigated.	Area irrigated per cubic foot of supply.
				Jowári.	Bájri.	Rice.	Other Crops.	By Lift.	By Flow.		
				Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
Upper Sind Frontier ...	Begári Canals...	Desert Canal ...	1,453	63,049	5,122	366	11,753	8,392	71,898	80,290	55·25
		Muradwah ...	373	4,993	1,357	178	3,833	357	10,004	10,361	27·27
		Unharwah ...	590	16,125	6,493	100	6,695	2,936	26,477	29,413	49·85
		Begári Canal ...	3,156	91,104	5,575	9,844	54,720	31,662	129,581	161,243	51·09
Shikárpur Collectorate ...	Shikárpur Canals ...	Sind Canal ...	1,222	17,671	487	21,236	4,973	11,618	32,749	44,367	36·29
	Ghár Canals ...	Sukkur Canal ...	1,857	17,418	694	26,585	10,492	...	...	55,189	30·56
		Ghár Canal ...	3,677	81,089	9,257	44,539	13,882	...	...	148,767	41·33
Thar and Párkar ...	Eastern Nára ...	Mithrau	2,311	377	15,785	54,732	12,209	11,450	71,653	83,103	35·96
Hyderabad Collectorate...	Hyderabad Canals ...	Mehrabwah ...	345	8,246	2,325	56	1,774	11,367	1,034	12,401	35·94
		Nasrat	518	12,255	1,459	103	2,894	11,399	5,312	16,711	32·26
		Naolakhi	999	28,598	5,170	525	13,036	35,083	12,246	47,329	47·38
		Márak	1,088	3,139	23,993	36	13,626	40,794	...	40,794	37·49
		Ghalu	655	1,287	23,959	...	10,591	35,798	39	35,837	54·71
		Nasir	422	1,122	18,279	...	7,912	27,286	27	27,313	64·72
		Sarfraz	401	386	16,353	4	5,360	21,903	200	22,103	55·12
	Fuleli Canals ...	Fuleli	7,738	2,828	65,761	160,694	17,910	78,374	168,819	247,193	32·00
		Imamwah ...	235	27	4,316	3,234	925	4,877	3,625	8,502	36·18
		Sanhi Guni ...	93	2	15	4,879	926	20	5,802	5,822	62·60
		Sherwah	88	2	57	3,260	63	24	3,358	3,382	38·43
		Aliwah	102	2	...	3,805	20	...	3,827	3,827	37·52

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

TABLE IX.

Rainfall in the Province of Sind for 1887-88.

Collectorates and Tálukas.			April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Total.
			In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.
Upper Sind Frontier.	Begári Canals.	Kashmor	...	—	...	0 16	1 43	...	..	...	...	0 26	0 3	...	1 88
		Thul ...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Jacobabad ...	...	...	...	...	0 66	...	...	...	...	0 52	0 7	...	1 25
		Shahdádpur ..	...	...	...	0 15	0 20	—	...	...	...	0 75	...	...	1 11
Shikárpur Collectorate.	Shikárpur Canals.	Ubauro	0 1	...	...	0 30	1 42	...	...	...	...	0 12	...	...	1 85
		Mirpur	...	...	...	0 37	1 25	...	...	...	...	...	...	...	1 62
		Ghotki	0 2	0 3	...	0 5	1 90	...	...	...	...	0 21	0 6	...	2 27
		Rohri	0 16	...	0 23	...	4 37	...	...	...	...	0 36	0 20	...	5 32
		Shikárpur ...	0 4	...	...	...	0 58	...	...	...	...	0 46	0 6	...	1 14
		Sukkur	0 3	...	0 41	...	5 0	...	...	...	...	0 40	0 9	...	0 98
		Gárhi Yásin ...	0 2	...	...	...	0 44	...	...	...	...	0 53	0 4	...	1 3
	Ghár Canals.	Ráto-dero ...	...	...	...	...	0 12	...	...	...	...	0 59	0 3	...	0 74
		Lárkháua ...	0 4	...	...	0 2	0 55	...	...	...	0 5	0 49	0 9	...	1 24
		Kambar	...	...	...	...	0 97	...	...	..	0 12	0 61	...	...	1 70
		Bákráni	...	...	...	0 1	0 42	...	...	...	...	0 23	0 9	...	0 75
		Mehar	0 18	...	...	...	0 58	...	...	...	...	0 33	0 5	...	1 14
		Wárah	0 42	...	...	...	0 18	...	...	...	0 9	0 32	0 15	...	1 16
		Khairpur Náthe-sháh	0 12	...	...	...	1 16	...	...	...	...	0 42	0 7	...	1 77
Thar and Párkar.	Eastern Nára	Khípra	...	...	...	0 51	0 87	...	...	...	...	0 55	...	...	1 93
		Umarkot ...	...	...	...	1 34	0 21	...	...	...	...	0 54	...	...	2 9
		Mitti	...	...	0 1	3 72	0 69	..	...	...	...	0 7	...	...	4 49
		Nagar	...	...	0 30	4 75	3 42	...	...	...	...	...	...	...	8 47
Hyderabad Collectorate.	Hyderabad Canals.	Kaudiáro ...	..	...	...	3 26	0 90	..	..	...	...	0 30	...	...	4 46
		Naushahro ...	...	...	0 5	0 33	0 50	...	...	...	...	0 78	...	...	1 86
		Tháru Sháh ...	...	...	0 25	0 45	0 50	...	...	...	...	0 93	...	...	2 13
		Moro	...	...	0 13	0 27	0 50	...	...	...	...	0 86	...	...	1 76
		Sákrand	..	..	0 18	0 30	0 83	—	...	...	...	0 90	..	...	2 21
		Hála	...	0 33	...	1 30	0 82	..	...	...	...	1 42	...	...	3 67
		Shahdádpur ...	....	...	...	0 34	1 5	...	...	...	...	1 7	...	...	2 46
		Tando Adam ...	...	....	...	1 38	1 42	...	...	...	...	1 0	...	...	3 80
		Tando Alahyar...	...	...	...	1 19	1 11	...	...	...	...	0 44	...	...	2 74
		Mirpur Khás ...	...	...	...	...	2 85	...	...	...	...	0 54	...	...	3 39
	Fuleli Canals	Hyderabad ...	...	—	...	1 50	1 82	...	...	...	...	1 9	...	...	4 31
		Dero Mohbat ...	...	...	...	3 17	0 61	...	...	...	...	0 53	...	..	4 31
		Tando Bágo ...	..	...	...	2 12	0 72	...	...	...	...	0 82	...	...	3 66
		Badin	...	...	...	2 62	0 60	...	—	...	...	1 0	...	...	4 22
		Tando Muhammad Khán	...	...	...	0 82	1 31	...	...	...	...	0 73	...	...	2 86
Karáchi Collectorate.	Karáchi Canals.	Dádú	0 10	...	...	0 20	0 7	...	...	...	...	1 9	...	...	1 46
		Johi	...	...	...	...	...	...	...	...	0 6	1 18	...	...	1 24
		Sehwan	...	...	0 55	0 70	0 95	...	...	...	—	1 0	...	...	3 10
		Mánjhand ...	...	...	0 40	0 90	1 9	—	...	...	...	1 13	...	...	3 52
		Kotri	...	...	...	0 96	1 33	...	...	...	—	2 40	...	...	4 69
		Bula Khán ...	...	...	0 20	1 75	0 54	...	...	...	...	1 40	...	...	3 89
		Jerruck	—	...	....	0 51	0 68	—	...	...	—	0 78	...	...	1 97
		Tatta	...	...	0 5	1 55	0 21	...	...	...	0 6	0 85	...	...	2 72
		Sákro	...	...	...	3 80	...	—	...	...	...	1 35	...	...	5 15
		Mirpur Batoro ...	...	...	...	1 39	...	...	...	...	...	0 70	...	...	2 9
		Sujáwal	....	...	0 50	2 7	—	...	...	...	...	0 72	...	...	3 29
		Sháhbandar ...	...	...	1 90	4 73	0 42	...	...	...	0 10	0 73	...	...	7 88
		Kotri Ghorábári .	...	...	...	1 33	0 9	...	...	...	0 1	0 62	...	...	2 5
		Keti	...	...	...	4 49	0 16	...	...	...	0 13	1 95	...	...	6 73
		Mugalbin ...	...	...	0 20	5 83	0 22	...	...	...	...	0 40	...	...	6 65
		Karáchi	...	...	0 3	1 79	0 72	...	...	...	...	1 56	...	...	4 10

GEO. LAMBERT, M.Inst. C.E.,
Superintending Engineer for Irrigation in Sind.

Memo. showing the amount of loss to Canals on account of difference between assessments of Water-rates on Jághir lands and the assessments at the ordinary rates in force for Government lands.

	To end of 1886-87.	During 1887-88.	To end of 1887-88.	Remarks.
	Rs.	Rs.	Rs.	
Major Works—Productive Works.				(*a*) Rs. 97 deducted on account of remissions in Khelát territory for previous years granted in 1887-88.
Desert Canal	(*a*)1,19,970	30,893	1,50,863	
Begári Canal	(*b*)2,14,208	34,085	2,48,293	(*b*) Rs. 37 do. do.
Eastern Nára Works	17,521	5,772	23,293	
Total ...	3,51,699	70,750	4,22,449	
Minor Works and Navigation—Works for which Capital and Revenue Accounts are kept.				
Sukkur Canal	15,243	4,471	19,714	
Ghár Canal	87,470	9,835	97,305	
Mehrabwah	317	431	748	
Alibhar Kacheri Canal	16,917	1,819	18,736	
Márak Great Canal	89,477	12,026	1,01,503	
Surfrazwah	37,882	9,089	46,971	
Fuleli Canal	7,28,702	1,35,515	8,64,217	
Total ...	9,76,008	1,73,186	11,49,194	
Works for which only Revenue Accounts are kept.				
Under Executive Engineer, Shikárpur Canals	...	25,435	...	
Do. Ghár do.	...	25,815	...	
Do. Hyderabad do.	...	69,287	...	
Do. Fuleli do.	...	2,076	...	
Do. Karáchi do.	...	34,281	...	
Total ...	...	1,56,894	...	

C. CUNNINGHAM,
For Examiner, Public Works Accounts.

STATEMENT No. I B.

Capital Account of Irrigation Works in Sind for and to end of 1887-88.

Name of Work.	During the year.										To end of the year.									
	Direct Charges.						Indirect Charges.			Grand Total.	Direct Charges.						Indirect Charges.			Grand Total.
	Works.	Establishment.	Tools and Plant.	Total.	Deduct-Receipts on Capital Account.	Total.	Capitalization.	Leave and Pension Allowance.	Total.		Works.	Establishment.	Tools and Plant.	Total	Deduct Receipts on Capital Account.	Total.	Capitalization.	Leave and Pension Allowances.	Total.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MAJOR WORKS. PRODUCTIVE WORKS. *In Operation.*	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Desert Canal	47,495	9,660	...	57,155	...	57,155	...	1,352	1,352	58,507	9,49,367	2,13,170	14,280	11,76,817	37	11,76,780	...	39,569	39,569	12,16,349
Unharwah	8,500	1,729	...	10,229	...	10,229	...	242	242	10,471	2,79,094	52,052	481	3,31,627	...	3,31,627	...	7,288	7,288	3,38,915
Begári Canal	5,059	1,030	...	6,089	...	6,089	...	144	144	6,233	13,91,068	2,29,894	4,666	16,25,628	19	16,25,609	4,246	43,224	47,470	16,73,079
Eastern Nára Works ...	78,422	34,833	498	1,13,753	...	1,13,753	...	4,877	4,877	1,18,630	38,92,690	9,66,946	41,141	49,00,777	176	49,00,601	2,669	1,79,465	1,82,134	50,82,735
Total Major Works ...	1,39,476	47 252	498	1,87,226	...	1,87,226	...	6,615	6,615	1,93,841	65,12,219	14,62,062	60,568	80,34,849	232	80,34,617	6,915	2,69,546	2,76,461	83,11,078
MINOR WORKS AND NAVIGATION.																				
Sukkur Canal	...	...	...	...	...	...	...	...	...	...	11,10,106	2,05,471	13,330	13,28,907	160	13,28,747	19,775	40,191	59,966	13,88,713
Ghár Canal	...	...	...	...	..	...	...	...	...	...	3,38,237	75,554	1,746	4,15,537	...	4,15,537	10,329	15,111	25,440	4,40,977
Mehrabwah	..	...	...	...	...	...	...	...	...	...	52,797	13,199	22	66,018	..	66,018	...	1,851	1,851	67,869
Alibhar Kacheri Canal ...	...	...	...	...	...	...	...	...	...	...	19,636	3,548	23	23,207	...	23,207	...	710	710	23,917
Márak Great Canal ...	...	...	...	...	...	...	...	...	...	...	1,59,516	32,719	1,445	1,93,680	80	1,93,600	1,409	6,544	7,953	2,01,553
Surfrazwah	...	...	...	...	...	...	...	...	...	...	1,03,432	15,097	30	1,18,559	...	1,18,559	3,102	3,019	6,121	1,24,680
Fuleli Canal	..	...	...	...	...	...	...	...	...	...	7,71,688	1,57,914	651	9,30,253	21	9,30,232	1,664	31,579	33,243	9,63,475
Total Minor Works ...	...	...	...	...	...	..	...	...	...	...	25,55,412	5,03,502	17,247	30,76,161	261	30,75,900	36,279	99,005	1,35,284	32,11,184
Grand Total ..	1,39,476	47,252	498	1,87,226	...	1,87,226	...	6,615	6,615	1,93,841	90,67,631	19,65,564	77,815	1,11,11,010	493	1,11,10,517	43,194	3,68,551	4,11,745	1,15,22,262

C. CUNNINGHAM,
For Examiner, Public Works Accounts.

STATEMENT No. I c.

Statement showing Financial Results of Irrigation Works in Sind for the year ending 31st March 1888.

Realizations under main heads of Revenue and Working Expenses.

Irrigation Works.	Revenue (actual Receipts).										Working Expenses.																Net Revenue.
	Irrigation.			Navigation.	Plantations.	Water-power.	Miscellaneous.	Total.	Refunds of Revenue.	Gross Revenue less Refunds.	Revenue Management.					Maintenance of Works.									Indirect Charges.	Grand Total, Working Expenses.	
											Establishment.				Total Revenue Management.	Establishment.				Works.	Repairs.	Sundries.	Tools and Plant.	Plantations.	Total cost of Maintenance.			
	Water-rates paid directly	Share of Land Revenue.	Total.								Direction.	Executive.	Navigation.	Civil Officers.		Direction.	Executive.	Medical.	Total.								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
	Rs.	Rs.	Rs.		Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
MAJOR WORKS.																												
Productive Works.																												
Desert Canal	36,742	91,709	1,28,451	...	11	...	218	1,28,680	...	1,28,680	..	1,170	...	9,175	10,345	2,161	6,220	...	8,381	...	30,474	239	149	...	39,243	1,337	50,925	77,755
Unharwah	10	53,206	53,216	...	...	...	30	53,246	...	53,246	...	...	...	5,321	5,321	638	1,800	...	2,438	...	9,001	...	100	...	11,539	341	17,201	36,045
Begári Canal	25,026	2,15,748	2,40,774	...	35	...	430	2,41,239	...	2,41,239	...	1,170	...	21,838	23,008	3,312	9,268	...	12,580	...	47,313	...	133	62	60,088	1,925	85,021	1,56,218
Eastern Nára Works	819	3,12,523	3,13,342	...	1,350	...	13,820	3,28,512	...	3,28,512	1,286	9,272	...	32,323	42,881	1,162	8,375	...	9,537	...	33,912	...	114	619	44,182	2,813	89,876	2,38,636
Total Major Works ...	62,597	6,73,186	7,35,783	...	1,396	...	14,498	7,51,677	...	7,51,677	1,286	11,612	...	68,657	81,555	7,273	25,663	...	32,936	...	1,20,700	239	496	681	1,55,052	6,416	2,43,023	5,08,654
Minor Works and Navigation.																												
Sukkur Canal	479	97,893	98,372	...	103	...	549	99,024	...	99,024	...	...	...	9,840	9,840	1,910	4,585	...	6,495	...	26,974	...	58	204	33,731	909	44,480	54,544
Ghár Canal	819	3,42,782	3,43,601	...	1,001	...	2,854	3,47,456	19	3,47,437	...	...	...	34,544	34,544	7,206	17,218	...	24,424	-17,552	84,093	...	108	...	1,26,177	3,419	1,64,140	1,83,297
Mehrabwah	...	23,181	23,181	..	...	...	202	23,383	...	23,383	...	...	...	2,318	2,318	387	1,026	...	1,413	...	5,457	...	...	...	6,870	198	9,386	13,997
Alibhar Kacheri Canal	635	4,109	4,744	...	15	...	...	4,759	...	4,759	...	...	...	474	474	309	820	...	1,129	...	4,364	...	...	...	5,493	158	6,125	—1,366
Márak Great Canal	1,895	45,264	47,159	...	187	...	121	47,467	...	47,467	...	...	...	4,716	4,716	764	1,923	...	2,687	..	10,780	...	...	...	13,467	376	18,559	28,908
Surfrazwah	1,540	19,751	21,291	...	225	...	123	21,639	...	21,639	...	...	...	2,129	2,129	550	1,458	...	2,008	...	7,756	...	...	...	9,764	281	12,174	9,465
Fuleli Canal...	18,924	3,58,502	3,77,426	...	864	...	3,773	3,82,063	...	3,82,063	...	...	...	37,743	37,743	12,261	24,884	...	37,145	..	1,72,942	...	19	...	2,10,106	5,200	2,53,049	1,29,014
Total Minor Works ...	24,292	8,91,482	9,15,774	...	2,395	...	7,622	9,25,791	19	9,25,772	...	...	...	91,764	91,764	23,387	51,914	...	75,301	17,552	3,12,366	..	185	204	4,05,608	10,541	5,07,913	4,17,859
Grand Total ...	86,889	15,64,668	16,51,557	...	3,791	...	22,120	16,77,468	19	16,77,449	1,286	11,612	...	1,60,421	1,73,319	30,660	77,577	...	1,08,237	17,552	4,33,066	239	681	885	5,60,660	16,957	7,50,936	9,26,513

C. CUNNINGHAM,
For Examiner of Public Works Accounts.

STATEMENT No. II C.

Statement showing the Financial Results of Irrigation Works in Sind for the year 1887-88 based on actual receipts, Principal Results of Operations for the year ended 31st March 1888.

Irrigation Works.	Direct and Indirect Capital outlay to end of 1887-88.	Gross Revenue, Direct and Indirect from all sources.	Working Expenses, Direct and Indirect.	Net Revenue (excluding charges for Interest.)	Interest at 4 per cent. on Direct Capital outlay at commencement of year and at 2 per cent. on outlay during year.	Surplus Revenue after paying Interest on Direct Capital Outlay.		Excess charges including Interest on Direct Capital Outlay.	
						Amount.	Percentage on total sum at charge.	Amount.	Percentage on total sum at charge.
1	2	3	4	5	6	7	8	9	10
MAJOR WORKS.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Public Works.									
In Operation.									
Desert Canal	12,16,349	1,28,680	50,925	77,755	45,928	31,827	4·92	.....	.....
Unharwah...	3,38,915	53,246	17,201	36,045	13,060	22,985	7·07	.....	.....
Begári Canal	16,73,079	2,41,239	85,021	1,56,218	64,902	91,316	11·16	.....	.....
Eastern Nára Works	50,82,735	3,28,512	89,876	2,38,636	1,93,749	44,887	0·75	.....	.....
Total Major Works ...	83,11,078	7,51,677	2,43,023	5,08,654	3,17,639	1,91,015	2·46	.....	.....
Minor Works and Navigation.									
Sukkur Canal	13,88,713	99,024	44,480	54,544	53,150	1,394	·06	.....	.....
Ghár Canal	4,40,977	3,47,437	1,64,140	1,83,297	16,621	1,66,676	(a)	.....	.....
Mehrabwah	67,869	23,383	9,386	13,997	2,641	11,356	21·11	.....	.....
Alibhar Kacheri Canal	23,917	4,759	6,125	—1,366	928	.....	.....	2,294	7·03
Márak Great Canal	2,01,553	47,467	18,559	28,908	7,744	21,164	(a)	.....	.....
Surfrazwah	1,24,680	21,639	12,174	9,465	4,742	4,723	2·61	.....	.....
Fuleli Canal	9,63,475	3,82,063	2,53,049	1,29,014	37,209	91,805	17·41	.....	.....
Total Minor Works ...	32,11,184	9,25,772	5,07,913	4,17,859	1,23,035	2,94,824	(a)	.....	.....
Grand Total ...	1,15,22,262	16,77,449	7,50,936	9,26,513	4,40,674	4,85,839	13·21	.....	.....

(a) The total sum at charge being minus no percentage can be calculated.

C. CUNNINGHAM,
For Examiner of Public Works Accounts.

STATEMENT No. III C.

Demands and Realizations during the year 1887-88 in Sind.

Irrigation Works.	Balance of demands unrealized at commencement of year.	Demands of the year.				Total including balance at commencement of year.	Deduct Remissions not including cash refunds.	Net Total.	Deduct amount unrealized at close of the year.	Actual receipts of the year.
		Rabi.	Kharíf.	Miscellaneous Receipts.	Total.					
MAJOR WORKS.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Works.										
Desert Canal	36,804	2,783	35,832	229	38,844	75,648	277	75,371	38,400	36,971
Unharwah...	.....	...	10	30	40	40	...	40	...	40
Begári Canal	27,332	140	28,338	465	28,943	56,275	1,148	55,127	29,636	25,491
Eastern Nára Works	309	341	782	15,170	16,293	16,602	...	16,602	613	15,989
Total Major Works ...	64,445	3,264	64,962	15,894	84,120	1,48,565	1,425	1,47,140	68,649	78,491
Minor Works and Navigation.										
Sukkur Canal	79	171	663	652	1,486	1,565	...	1,565	434	1,131
Ghár Canal	67	15	1,000	3,855	4,870	4,937	...	4,937	263	4,674
Mehrabwah	.....	...	...	202	202	202	...	202	...	202
Alibhar Kacheri Canal	642	...	288	15	303	945	...	945	295	650
Márak Great Canal	2,206	...	1,630	308	1,938	4,144	...	4,144	1,941	2,203
Surfrazwah	2,617	29	1,442	348	1,819	4,436	...	4,436	2,548	1,888
Fuleli Canal	9,980	1,154	17,446	4,637	23,237	33,217	...	33,217	9,656	23,561
Total Minor Works and Navigation...	15,591	1,369	22,469	10,017	33,855	49,446	...	49,446	15,137	34,309
Grand Total ...	80,036	4,633	87,431	25,911	1,17,975	1,93,011	1,425	1,96,586	83,786	1,12,800

C. CUNNINGHAM,
For Examiner of Public Works Accounts.

STATEMENT No. IV c.

Statement showing the Financial Results of Irrigation Works in Sind for the year 1887-88 based on Assessment of the year. Principal Results and Operations for the year ended 31st March 1888.

Irrigation Works.	Capital outlay (Direct and Indirect) to end of year.	Revenue Assessed during the year.									Working Expenses, Direct and Indirect.	Net assessed Revenue of the year.	Percentage on Capital outlay to end of year.
		Direct Assessed Revenue.							Indirect Revenue, Land Revenue due to operation of Canal.	Grand Total.			
		Occupier's Rates.	Owner's Rates.	Plantations.	Water-power.	Navigation.	Miscellaneous.	Total.					
	Rs.	Rs.		Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Major Works.													
Productive Works.													
Desert Canal	12,16,349	38,615	...	11	...	...	218	38,844	89,722	1,28,566	50,925	77,641	6·38
Unharwah	3,38,915	10	...	...	...	...	30	40	53,155	53,195	17,201	35,994	10·62
Begári Canal	16,73,079	28,478	...	35	...	...	430	28,943	2,05,933	2,34,876	85,021	1,49,855	8·96
Estern Nára Works	50,82,735	1,123	...	1,350	...	...	13,820	16,293	3,12,358	3,28,651	89,876	2,38,775	4·70
Total, Major Works ...	83,11,078	68,226	...	1,396	...	...	14,498	84,120	6,61,168	7,45,288	2,43,023	5,02,265	6·04
Minor Works and Navigation.													
Sukkur Canal...	13,88,713	834	...	103	...	...	549	1,486	96,572	98,058	44,480	53,578	3·86
Ghár Canal	4,40,977	1,015	...	1,001	...	...	2,854	4,870	3,39,772	3,44,642	1,64,140	1,80,502	40·93
Mehrabwah	67,869	...	...	..	...	...	202	202	23,181	23,383	9,386	13,997	20·62
Alibhar Kacheri Canal	23,917	288	...	15	...	...	...	303	3,779	4,082	6,125	—2,043	8·54
Márak Great Canal	2,01,553	1,630	...	187	...	...	121	1,938	42,226	44,164	18,559	25,605	12·70
Surfrazwah	1,24,680	1,471	...	225	...	...	123	1,819	17,832	19,651	12,174	7,477	6·00
Fuleli Canal	9,63,475	18,600	...	864	...	...	3,773	23,237	3,58,333	3,81,570	2,53,049	1,28,521	13·34
Total, Minor Works and Navigation.	32,11,184	23,838	...	2,395	...	...	7,622	33,855	8,81,695	9,15,550	5,07,913	4,07,637	12·69
Grand Total ...	1,15,22,262	92,064	...	3,791	...	...	22,120	1,17,975	15,42,863	16,60,838	7,50,936	9,09,902	7·89

C. CUNNINGHAM,
For Examiner of Public Works Accounts

General Asbtract of Financial Results of Irrigation Works

WORKS IN

	Major Works—Productive Works.					Minor Works and Navigation—works for which Capital.				
	Desert Canal.	Unharwah.	Begári Canal.	Eastern Nára Works.	Total.	Sukkur Canal.	Ghár Canal.	Mehrabwah.	Alibhar Kacheri Canal.	Márak Great Canal.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Capital Outlay.										
During year ... Direct ...	57,155	10,229	6,089	1,13,753	1,87,226	...	...	...	...	...
During year ... Indirect ...	1,352	242	144	4,877	6,615	...	.....	...	...	...
Total ...	58,507	10,471	6,233	1,18,630	1,93,841	...	.....	...	...	...
To end of year ... Direct ...	11,76,780	3,31,627	16,25,609	49,00,601	80,34,617	13,28,747	4,15,537	66,018	23,207	1,93,600
To end of year ... Indirect ...	39,569	7,288	47,470	1,82,134	2,76,461	59,966	25,440	1,851	710	7,953
Total ...	12,16,349	3,38,915	16,73,079	50,82,735	83,11,078	13,88,713	4,40,977	67,869	23,917	2,01,553
Gross Revenue.										
During year ... Direct ...	36,971	40	25,491	15,989	78,491	1,131	4,674	202	650	2,203
During year ... Indirect ...	91,709	53,206	2,15,748	3,12,523	6,73,186	97,893	3,42,782	23,181	4,109	43,264
Total ...	1,28,680	53,246	2,41,239	3,28,512	7,51,677	99,024	3,47,456	23,383	4,759	47,467
To end of year ... Direct ...	1,67,896	72	2,40,813	5,42,966	9,51,747	13,063	1,85,531	718	10,265	45,962
To end of year ... Indirect ...	13,47,419	1,18,129	35,00,403	43,20,650	92,86,601	8,28,227	1,09,86,879	1,03,163	89,958	6,97,227
Total ...	15,15,315	1,18,201	37,41,216	48,63,616	1,02,38,348	8,41,290	1,11,72,410	1,03,881	1,00,223	7,43,189
Working Expenses.										
During year ... Direct ...	49,588	16,860	83,096	87,063	2,36,607	43,571	1,60,740	9,188	5,967	18,183
During year ... Indirect ...	1,337	341	1,925	2,813	6,416	909	3,419	198	158	376
Total ...	50,925	17,201	85,021	89,876	2,43,023	44,480	1,64,159	9,386	6,125	18,559
To end of year ... Direct ...	4,38,274	42,083	17,91,526	23,28,099	45,99,982	7,89,991	31,15,794	63,071	94,810	2,51,921
To end of year ... Indirect ...	12,867	923	48,541	1,03,837	1,66,168	23,800	70,894	1,501	2,875	6,394
Total ...	4,51,141	43,006	18,40,067	24,31,936	47,66,150	8,13,791	31,86,688	64,572	97,685	2,58,315
Net Revenue.										
During year	77,755	36,045	1,56,218	2,38,636	5,08,654	54,544	1,83,297	13,997	—1,366	28,908
To end of year	10,64,174	75,195	19,01,149	24,31,680	54,72,198	27,499	79,85,722	39,309	2,538	4,84,874
Simple Interest.										
During year	45,928	13,060	64,902	1,93,749	3,17,639	...	.....	...	...	...
To end of year	4,62,623	38,483	9,55,145	32,88,965	47,45,216	...	.....	...	...	...
Net profit after paying off Interest.										
During year	31,827	22,985	91,316	44,887	1,91,015	...	.....	...	...	...
To end of year	6,01,551	36,712	9,46,004	—8,57,285	7,26,982	...	.....	...	...	...

Note—Direct outlay under Working Expenses includes share of cost of

in Sind for and up to the close of 1887-88.

OPERATION.												
AND REVENUE ACCOUNTS ARE KEPT.				MINOR WORKS AND NAVIGATION—WORKS FOR WHICH ONLY REVENUE ACCOUNTS ARE KEPT.						Expenditure on and Receipts from Agricultural Works for which neither Capital nor Revenue Accounts are kept.		
Surfrazwah.	Fuleli Canal.	Total.	Grand Total.	Under Executive Engineer, Shikárpur Canals.	Under Executive Engineer, Ghár Canals.	Under Executive Engineer, Hyderabad Canals.	Under Executive Engineer, Fuleli Canals.	Under Executive Engineer, Karáchi Canals.	Total.		Expenditure.	Receipts.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.
...	...	...	1,87,226	...	...	...	...	...	...	*Begári Canals.*		
...	...	...	6,615	...	...	...	...	...	...	*Kashmor Bund.*		
...	...	...	1,93,841	...	...	...	...	...	...	Loop bund near Kashmor	42,249	
										Small legth of loop near Dari	298	
1,18,559	9,30,232	30,75,900	1,11,10,517	...	...	...	...	...	...	Maintenance and repairs to the bund	35,829	
6,121	33,243	1,35,284	4,11,745	...	...	...	...	...	...	Maintenance of garden at Badani	480	
										Rent of Telegraph line at Badani	1,800	
1,24,680	9,63,475	32,11,184	1,15,22,262	...	...	...	...	...	...	Maintenance and repairs, Buxaliwah	608	
										Bund to protect the town of Khaira Garhi... ...	3,466	
1,888	23,561	34,309	1,12,800	5,027	7,571	12,843	574	18,724	44,739	General charges for Establishment and Tools and Plant	17,279	
19,751	3,58,502	8,91,482	15,64,668	3,23,054	4,07,055	4,74,322	41,468	5,26,074	17,71,973	Share of collection charges in the Civil Department	696	
21,639	3,82,063	9,25,791	16,77,468	3,28,081	4,14,626	4,87,165	42,042	5,44,798	18,16,712			
											1,02,705	223
27,273	5,34,930	8,17,742	17,69,489	...	...	...	...	...	...	Irrigation share of Land Revenue...	...	6,958
1,77,168	49,92,033	1,78,74,655	2,71,61,256	...	...	...	...	...	...	Total, Begári Canals ...	1,02,705	7,181
2,04,441	55,26,963	1,86,92,397	2,89,30,745	...	...	...	...	...	...	*Shikárpur Canals.*		
										Forest sluice in Sukkur and Begári Bund ...	1,426	
11,893	2,47,849	4,97,391	7,33,998	2,31,358	1,14,223	1,93,057	28,559	4,35,197	10,02,394	Two sluices in Kásimpur Bund to water Rohri Forest	3,142	
281	5,200	10,541	16,957	...	...	...	...	...	...	Kásimpur Bund	1,448	
										General charges for Establishment and Tools and Plant	1,478	
12,174	2,53,049	5,07,932	7,50,955	2,31,358	1,14,223	1,93,057	28,559	4,35,197	10,02,394	Total, Shikárpur Canals...	7,494	12
1,77,526	39,33,040	84,26,153	1,30,26,135	...	...	...	...	...	...			
6,525	1,20,943	2,32,932	3,99,100	...	...	...	...	...	...	*Ghár Canals*	...	16
1,84,051	40,53,983	86,59,085	1,34,25,235	...	...	...	...	...	...	*Eastern Nára District* ...	...	3
										Karáchi Canals.		
9,465	1,29,014	4,17,859	9,26,513	96,723	3,00,403	2,94,108	13,483	1,09,601	8,14,318	Constructing sluice in Sumarwah Surjani Forest ...	753	
20,390	14,72,980	1,00,33,312	1,55,05,510	...	...	...	...	...	...	Do. Mirwah Gunj do. ...	701	
										General charges for Establishment and Tools and Plant	904	
...	...	...	...	...	...	...	...	...	...	Total Karáchi Canals ...	2,358	...
...	...	...	...	...	...	...	...	...	...			
										Mathematical Instrument Depôt in Sind	—66	...
...	...	...	...	...	...	...	...	...	...			
...	...	...	...	...	...	...	...	...	...	Total ...	1,12,491	7,212

Collection in the Civil Department.

C. CUNNINGHAM,
For Examiner of Public Works Accounts.

BUKKUR GAUGE.

Series of readings for the year 1887.

Series of Mean readings for 10 years ending 1887.

Series of Mean readings for 4 years ending 1886.

Days.	JUNE.						JULY.						AUGUST.						SEPTEMBER.						Remarks.
	Readings for 1887.		10 years' M ending 1887.		4 years' M end. ing 1886.		Readings for 1887.		10 years' M ending 1887.		4 years' M end. ing 1886.		Readings for 1887.		10 years' M ending 1887.		4 years' M end. ing 1886.		Readings for 1887.		10 years' M ending 1887.		4 years' M end. ing 1886.		
	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	
1 ...	7	11	8	8	8	11	8	5	12	3	12	4	15	6	14	6	14	4	12	10	12	11	13	11	Readings of the year 1887 shown in Roman. Mean readings for 10 years ending 1887 shown in Block. Mean readings for 4 years ending 1886 shown in Italics. M. is marked for "mean."
2 ...	7	10	8	8	8	10	8	4	12	5	12	5	15	8	14	7	14	4	13	1	12	10	12	9	
3 ...	7	9	8	8	8	10	8	6	12	6	13	6	15	7	14	6	14	3	12	10	12	8	12	4	
4 ...	8	1	8	10	9	0	8	8	12	7	12	7	15	3	14	3	13	9	12	6	12	6	12	0	
5 ...	9	2	9	3	9	4	9	2	12	6	12	5	14	11	14	1	13	4	11	7	12	5	12	0	
6 ...	10	1	9	9	9	5	9	9	12	8	12	9	15	2	14	1	13	1	11	6	12	5	12	0	
7 ...	10	4	10	0	9	6	10	5	12	0	12	11	15	1	14	1	12	11	11	6	12	4	12	3	
8 ...	10	5	10	3	9	6	10	9	13	1	13	4	15	7	14	2	13	0	11	11	12	5	12	3	
9 ...	10	3	10	3	9	8	11	2	13	4	13	8	15	8	14	4	13	4	12	1	12	3	12	3	
10 ...	10	2	10	3	9	8	11	7	13	5	14	0	15	9	14	5	13	7	10	9	12	0	12	2	
11 ...	9	10	10	2	9	8	12	0	13	7	14	3	16	0	14	6	13	10	10	9	11	8	11	10	
12 ...	9	8	10	1	9	7	12	9	13	8	14	6	16	0	14	7	14	0	10	2	11	5	11	8	
13 ...	9	5	10	2	9	8	13	0	13	10	14	7	16	4	14	8	14	2	9	9	10	2	11	7	
14 ...	9	2	10	2	9	9	12	9	13	10	14	6	16	3	14	8	14	4	9	8	10	11	11	6	
15 ...	9	0	10	5	9	11	12	7	14	0	14	6	16	4	14	8	14	5	9	0	10	6	10	11	
16 ...	9	0	10	8	10	2	12	3	14	1	14	7	16	4	14	8	14	6	8	8	10	2	10	5	
17 ...	9	1	10	11	10	6	12	5	14	1	14	7	16	3	14	6	14	3	8	5	10	1	9	10	
18 ...	9	4	11	2	10	10	13	0	14	3	14	8	16	7	14	5	14	0	8	2	10	1	9	5	
19 ...	9	5	11	7	11	2	13	1	14	3	14	8	16	6	14	5	13	11	7	11	10	0	9	3	
20 ...	9	3	11	9	11	2	13	1	14	4	14	8	16	5	14	4	13	10	7	9	10	0	9	2	
21 ...	9	3	12	0	11	4	12	10	14	3	14	9	15	11	14	3	13	9	7	6	9	10	9	2	
22 ...	9	1	12	2	11	6	13	0	14	4	14	10	15	5	14	2	13	8	7	2	9	7	9	0	
23 ...	9	1	12	2	11	6	13	4	14	4	14	9	15	3	14	1	13	7	6	11	9	1	8	7	
24 ...	9	0	12	0	11	7	13	8	14	5	14	9	15	4	14	0	13	5	6	8	8	7	8	0	
25 ...	8	11	12	1	11	10	14	0	14	5	14	8	14	11	13	9	13	3	6	6	8	3	7	7	
26 ...	9	2	12	1	11	11	14	1	14	5	14	5	14	2	13	7	13	1	6	10	8	0	7	4	
27 ...	9	3	12	1	12	0	14	6	14	4	14	3	14	3	13	6	13	2	7	5	7	9	7	1	
28 ...	9	2	12	0	12	0	15	0	14	5	14	1	14	7	13	5	13	0	7	4	7	5	6	11	
29 ...	8	11	12	1	12	2	15	2	14	5	14	0	14	8	13	5	13	1	7	0	7	2	6	8	
30 ...	8	8	12	2	12	2	15	3	14	5	14	2	14	1	13	4	12	8	6	8	7	0	6	7	
31 ...	...		...		...		15	6	14	6	14	8	12	11	13	1	13	0	...		...		...		

KOTRI GAUGE.

Series of readings for the year ending 1887.

Series of Mean readings for 10 years ending 1887.

Series of Mean readings for 4 years ending 1886.

Days.	JUNE.						JULY.						AUGUST.						SEPTEMBER.						Remarks.
	Readings for 1887.		10 years' M ending 1887.		4 years' M end. ing 1886.		Readings for 1887.		10 years' M ending 1887.		4 years' M end. ing 1886.		Readings for 1887.		10 years' M ending 1887.		4 years' M end. ing 1886.		Readings for 1887.		10 years' M ending 1887.		4 years' M end. ing 1886.		
	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	
1 ...	10	6	10	9	10	8	11	7	14	7	14	9	17	4	17	7	17	10	17	10	17	7	17	8	Readings of the year 1887 shown in Roman. Mean readings for 10 years ending 1887 shown in Block. Mean readings for 4 years ending 1886 shown in Italics. M. is marked for "mean."
2 ...	10	5	10	11	10	11	11	2	14	8	14	10	17	6	17	7	17	10	17	4	17	5	17	7	
3 ...	10	3	10	11	11	1	10	11	14	8	14	11	17	8	17	6	17	9	17	1	17	3	17	7	
4 ...	10	0	10	11	11	3	10	11	14	10	15	1	17	11	17	7	17	10	16	10	17	1	17	7	
5 ...	9	9	10	11	11	2	10	8	14	11	15	2	18	0	17	8	17	10	16	8	17	1	17	6	
6 ...	9	10	11	0	11	4	10	8	15	1	15	4	18	2	17	9	17	11	16	5	17	0	17	4	
7 ...	10	5	11	3	11	6	10	10	15	2	15	5	18	3	17	8	17	9	15	11	16	11	17	1	
8 ...	11	5	11	8	11	9	11	3	15	3	15	6	18	3	17	7	17	6	15	7	16	10	16	11	
9 ...	12	3	12	1	11	11	11	11	15	4	15	8	18	5	17	7	17	3	15	6	16	9	16	10	
10 ...	12	9	12	3	11	11	12	8	15	6	15	11	18	6	17	8	17	4	15	8	16	8	16	10	
11 ...	13	0	12	6	12	0	13	5	15	8	16	2	18	7	17	9	17	5	15	10	16	7	16	9	
12 ...	12	11	12	6	12	2	14	1	15	10	16	5	18	9	17	10	17	5	15	7	16	5	16	8	
13 ...	12	7	12	6	12	2	14	8	16	1	16	7	18	10	18	0	17	7	15	1	16	3	16	6	
14 ...	12	3	12	5	12	1	15	2	16	3	16	9	18	11	18	1	17	9	14	5	16	0	16	4	
15 ...	12	0	12	4	12	0	15	5	16	4	16	11	18	11	18	1	17	10	13	11	15	9	16	2	
16 ...	11	10	12	5	12	1	15	7	16	5	17	1	19	0	18	2	17	11	13	5	15	7	16	0	
17 ...	11	8	12	6	12	4	15	8	16	6	17	3	19	1	18	3	18	0	13	0	15	3	15	8	
18 ...	11	6	12	7	12	6	15	7	16	7	17	3	19	3	18	3	18	1	12	8	14	11	15	2	
19 ...	11	6	12	9	12	9	15	8	16	8	17	3	19	4	18	3	18	2	12	5	14	10	14	9	
20 ...	11	9	13	1	13	1	15	11	16	10	17	4	19	5	18	3	18	2	12	2	14	8	14	8	
21 ...	11	10	13	5	13	5	16	1	16	10	17	5	19	6	18	2	18	0	11	10	14	7	13	11	
22 ...	12	1	13	9	13	7	16	1	16	11	17	5	19	8	18	1	18	0	11	6	14	4	13	9	
23 ...	12	0	14	0	13	8	16	0	17	0	17	6	19	8	18	1	17	11	11	4	14	2	13	7	
24 ...	11	8	14	2	13	10	16	2	17	1	17	8	19	7	18	0	17	10	11	1	14	0	13	5	
25 ...	11	7	14	4	14	0	16	5	17	3	17	11	19	5	18	0	17	9	10	10	13	8	13	3	
26 ...	11	6	14	5	14	1	16	6	17	4	18	1	19	3	17	11	17	8	10	9	13	5	12	11	
27 ...	11	5	14	6	14	4	16	6	17	5	18	2	19	1	17	11	17	8	10	8	12	10	12	5	
28 ...	11	4	14	6	14	6	16	8	17	5	18	3	18	11	17	10	17	8	10	9	12	5	12	0	
29 ...	11	7	14	6	14	7	16	11	17	7	18	3	18	6	17	9	17	8	11	0	12	1	11	9	
30 ...	11	8	14	6	14	8	17	1	17	7	18	1	18	2	17	8	17	7	11	2	11	10	11	6	
31 ...	...		...		...		17	2	17	7	17	11	18	1	17	7	17	7	...		...		...		

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

List of highest readings on Bukkur and Kotri Gauges for 10 years from 1878 to 1887.

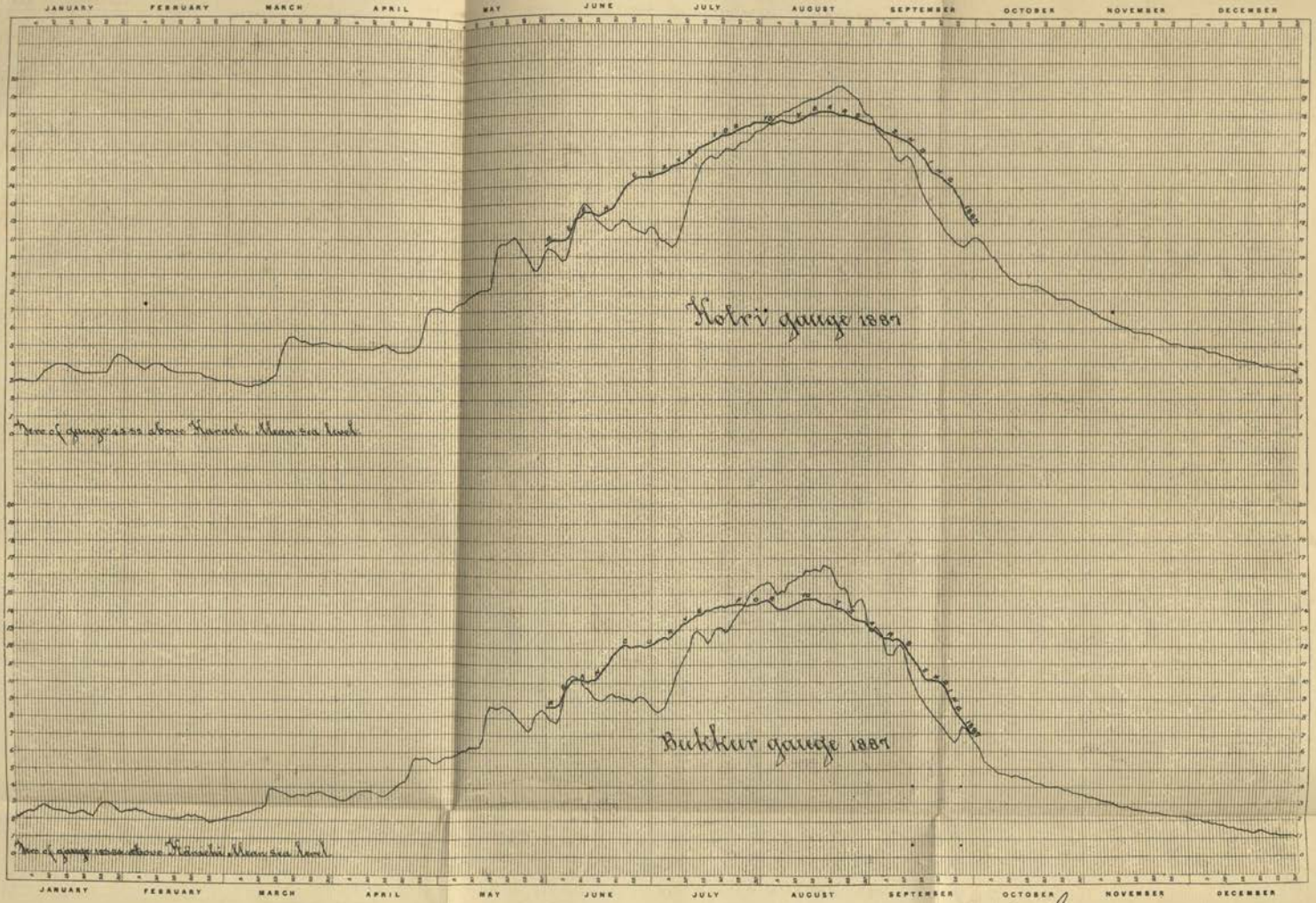
BUKKUR GAUGE.

1878.			1879.			1880.			1881.			1882.			1883.			1884.			1885.			1886.			1887.		
Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.
24th August ..	15	6	20th August ..	16	1	8th July ..	14	11	20th June ..	14	5	7th August ..	17	7	17th July ..	15	11	19th August ..	15	9	20th July ..	15	5	22nd July ..	16	3	18th August.	16	7

KOTRI GAUGE.

14th August ..	19	6½	1st September.	19	7	14th August ..	17	1	28th August ..	17	2	17th August ..	20	5½	26th July ..	18	9	27th August ..	19	2	4th September.	20	4	19th August.	20	3	22nd August.	19	8

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.



Seasonal Paper to register the rise and fall of rivers &c. Supplied by the Geographical Branch of the Public Works Department, India Office, London. 1887.

Geo Lambert M. Inst. C.E.
Superintending Engineer.
for Irrigation.
in Sind.

Govt Photozincco Office, Poona. 1889

Temple dera
Jhatpat
Khairpur
Shikarpur
Kot Diji
Jamgir
Kot Imamgarh
Kakar
Kashmor
Ghaibi dero
Kamkot
Mehar
Kotri
Kandiaro
Kakar
Pulji
Dadu
Johi
Sann
Manjhand
Shah Bilawal
Haidarabad
Badin
Umarkot
Sanghar
Tando Allahyar
Tando Adam
Mirpur Khas
Nawabshah
Mirpur
Thatta
Kohistan
Kachhi
Sukkur
Jacobabad
Larkana
Dadu
Nasirabad
Jamshoro
Hyderabad
Thar
Parkar
Nagar
Umarkot
Sanghar
Khairpur
Shikarpur
Jacobabad

INDEX MAP
of the
PROVINCE OF SIND
to accompany Canal Revenue Report
Scale 16 Miles to an Inch
Note. Roads ruled as far as possible in straight lines
Boundaries of Canal Districts shown in dotted lines
Karachi 18th September 1880
Photozincographed from a Lithograph.
Govt Photozinco Office, Poona, 1889.
Geo Lambert M. Inst. C.E.
Superintending Engineer.
for Irrigation.
in Sind.
Shah Bilawal
Sonmiani
Cape Monze
Manora Lighthouse
Karachi
Ghara
Khana
Guja
Tatta
Mirpur Sakru
Kotri
Kujemri mouth
Kheti
Shahbandar
Mogulbin
Haidarabad
Kotri
Jhirak
Dadro
Mahd Khan ka Tanda
Mahbatdera
Talhar
Nasir
Manak
Mir
Baga Tanda
Shadi
Badin
Ninda Shahr
Lowari
Kadan
Bahadru
Alibandar
Wanga bazar
Romaki bazar
Binjui kot
Sindri
Lakpat
Khori Creek
Mandavi
Umarkot
Chachra
Nowakot
Mitti
Dipla
Nagar Parkar
Kipra
Sindri
Mirpur
Sangar
Shahpur
Syadabad
Shadadpur
Brahminabad
Alikahr Hala
Matari
Sakrand
Amri
Sawa
Mirpur Batoro
Syda
Gangra
Gadak
Kharo creek
Mal
Mirpur
Bilhur
Jhuda
Nasir
Mir
Shadi
Kadan
Bahadru
Mandavi

No. 3861 of 1888.

Public Works Department.

From

The SUPERINTENDING ENGINEER for
IRRIGATION in SIND;

To

The SECRETARY to GOVERNMENT,
Public Works Department (Irrigation) Bombay.

Camp Bago Tando, 20th December 1888.

Sir,

I have the honour to forward my Irrigation Revenue Report for 1887-88 with the usual tables, charts, and Index map of Sind, and also comparative statement showing a series of readings of the gauges at Bukkur and Kotri.

2. The report is only three days in advance of the report for the previous year, and although I hoped to submit it much earlier, I was unable to do so, because I did not receive from the Examiner of Public Works Accounts, the General Revenue Accounts, General Abstract of Financial results, and other statements of the Irrigation Works in Sind until the 7th of the current month, and it was only on the 12th instant, owing to pressure of other work, that I was able to commence my statistics, and take the report in hand.

I have the honour to be,

Sir,

Your most obedient Servant,

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer for Irrigation in Sind.

Forwarded through the Commissioner in Sind.

No. 399 OF 1889.

PUBLIC WORKS DEPARTMENT.

Commissioner's Office, Camp Tharwah, 31st January 1889.

* Superintending Engineer's letter No. 3861, dated the 20th December 1888, forwarding Sind Irrigation Revenue Report for 1887-88.

*Submitted to Government.

2. The Superintending Engineer's report submitted on the 20th December 1888, reached the Commissioner on the 1st January 1889. The date of submission is three days earlier than in the previous year.. Last year's report was delayed because discrepancies discovered in Canal Returns VIII and VIII A had to be rectified, and also because the preparation of the report was new to Mr. Lambert, who had besides very heavy current work which took up most of his time. This year the delay is attributed to the non-receipt from the Examiner of—the General Revenue Accounts, the General Abstract of Financial results and other statements, and also to "the pressure of other work" in Mr. Lambert's office. The returns from the Examiner did not reach Mr. Lambert until the 7th December and the report was not taken in hand until the 12th. The actual preparation of the report thus, appears to have taken only seven or eight days, so that the responsibility for the delay, which has been the subject of telegraphic communication from Government, would appear to rest with the Examiner of Public Works Accounts.

3. The season was on the whole favorable. The inundation was somewhat irregular and deficient, but the rainfall was seasonable and the prices of produce ruled unusually high. The rain that fell in the kharif season saved crops that would have suffered from the low inundation, and throughout the rabi season heavy showers were frequent all over the province and brought to maturity a bumper rabi crop. The remissions asked for and granted were below the average of recent years, the deficiency in outturn in some localities having been counterbalanced by the high prices obtained for grain and seeds. The areas (kharif and rabi) cultivated, the realizations on account of Canal Revenue, and the remissions granted in each Canal Division during the year under report are contrasted with those of the preceding year in the following table :—

Canal Divisions.	1886-87.					1887-88.					Contrast.				
	Area cultivated.		Total Canal Revenue (*i. e.* Consolidated Revenue).	Revenue taken credit for by the Irrigation Department (*i. e.* Water share).	Remissions.	Area cultivated.		Total Canal Revenue (*i. e.* Consolidated Revenue).	Revenue taken credit for by the Irrigation Department (*i. e.* Water share).	Remissions.	Area cultivated.		Total Canal Revenue.	Revenue taken credit for by the Irrigation Department.	Remissions.
	Kharif.	Rabi.				Kharif.	Rabi.				Kharif.	Rabi.			
	Acres.	Acres.	Rs.	Rs.	Rs.	Acres.	Acres.	Rs.	Rs.	Rs.	Acres.	Acres.	Rs.	Rs.	Rs.
Begari	1,91,519	12,706	4,31,371	3,69,932	20,335	1,96,167	13,423	4,35,947	3,80,624	13,032	+ 4,648	+ 717	+ 4,576	+ 10,692	— 7,303
Shikarpur	96,444	22,179	3,43,293	3,08,363	668	97,460	28,086	3,58,403	3,22,473	101	+ 1,016	+ 5,907	+ 15,110	+ 14,110	— 567
Ghar	3,38,233	32,778	12,47,369	10,39,583	92,277	3,16,696	54,314	11,67,072	10,31,119	21,387	— 21,537	+ 21,536	— 80,297	— 8,464	— 70,890
Eastern Narà...	1,02,486	30,703	2,85,098	2,56,550	43	1,28,197	39,948	3,51,068	3,15,802	177	+ 25,711	+ 9,245	+ 65,970	+ 59,252	+ 134
Hyderabad	2,86,077	23,495	6,70,142	6,00,052	3,418	2,88,523	19,181	6,85,083	6,13,847	3,031	+ 2,446	— 4,314	+ 14,941	+ 13,795	— 387
Fuleli	1,96,373	17,893	5,27,576	4,74,182	707	2,10,294	26,766	5,91,154	5,29,157	3,203	+ 13,921	+ 8,873	+ 63,578	+ 54,975	+ 2,496
Karachi	1,96,646	46,134	6,19,899	5,40,837	18,971	2,00,879	33,693	6,06,861	5,27,269	21,006	+ 4,233	— 12,441	— 13,038	— 13,568	+ 2,035
Total... ...	14,07,778	1,85,888	41,24,748	35,89,499	1,36,419	14,38,216	2,15,411	41,95,588	37,20,291	61,937	+ 30,438	+ 29,523	+ 70,840	+1,30,792	— 74,482

The principal extensions of kharif cultivation occurred on the Eastern Nara and Fuleli Canals. That on the Eastern Nara Canals is in keeping with the steady growth of cultivation observed there for some years past, and that on the Fuleli is due to the clearance of one of the tails in the Badin Taluka that restored to cultivation lands that had been swamped for some years. The increase on these canals amounts to about 40,000 acres, and that on all other canals, except on those in the Ghar Division where the extent of kharif cultivation was less by about 22,000 acres than in 1886-87, aggregates 12,343 acres. The decline of cultivation in the Ghar Division, which has been progressive for several years, is due to the vagaries of the river in the neighbourhood of the two mouths of the Ghar Canal. The chief increase of rabi cultivation (21,536 acres) occurred in the Ghar Division and is made up as follows:—

	Acres.
Sukkur Canal	5,258
Ghar Canal	7,566
Western Nara	8,113
Wahar Canal	585
Bands	14
Total	21,536

Of these canals the Sukkur Canal is the only one that carries a Rabi supply. Rabi cultivation on the other canals abovementioned and on most other canals in Sind is from waterings obtained during the kharif season aided by showers that almost always fall in the cold weather and by well irrigation. Well cultivation has been greatly extended in recent years, especially in the Hyderabad and Shikarpur Districts.

4. The river began to rise on the 12th May and reached on the 15th a height of 8′ 7″; fluctuating slightly between the 15th and 20th, it fell a little till the 25th, when it rose again and, with one slight fall in the interval, reached 10′ 5″ on the 8th June. Then followed a gradual fall to 8′ 4″ on the 2nd July, when it began to rise once more, and finally attained its maximum height for the year (16′ 7″) on the 18th August.

5. It would appear from this account of the inundation that the river had risen sufficiently high in the early part of May to have afforded many of the canals their first supply; but, except in the case of a few canals, the supply in the river was not made available to cultivators till the end of the month or the early part of June. The report shows for some canals, but not for others, the dates on which they were opened. The Fuleli and Eastern Nara Canals and some others were opened in good time. Those in the Hyderabad Canals Division were the latest of all. It appears from other correspondence that only two of these canals were opened before the end of May. The rest were opened on various dates between the 1st and 15th June, a fortnight to three weeks later than in the preceding year, and consequently lost the benefit of the first rise of the river. Water was not admitted into some of them until after the second rise had begun to subside.

6. Mr. Lambert dwells on the disheartening effect which a low inundation in June has on the cultivators in curtailing their preparations for cultivation, &c., but, from what the Commissioner has learned from reports by Collectors and seen and heard in the course of his tours, he is convinced that the loss of the first rise in the river has a still more serious effect. With the first appearance of water in the canals the people begin to bestir themselves to make preparations for cultivation and, even if the supply comes in before the time has arrived for sowing the staple crops, it is most valuable for drinking purposes and for the growth of green forage and vegetables, as well as for raising seedlings and for wetting land for the plough. There can be no doubt that the area of cultivation is diminished, and that both cultivators and the revenue suffer, when preparations for cultivation are unnecessarily and unduly

delayed. Complaints by cultivators of delays in opening canals, and of calls made on them for assistance in completing clearance at times when they ought to have been working in their own fields, have not been absent in recent years.

7. All canals should be in working order by the 15th May at latest, and all ordinary clearance should be completed by the 30th April, to allow of the work done by contractors being measured up and checked before water comes in and renders exact measurement impossible. The popular view—which is very openly expressed—is that contractors in some Divisions delay clearance work in order to prevent check measurements being made by the European officers of the Public Works Department. The Commissioner expresses no opinion as to the correctness or incorrectness of this view, or as to the responsibility attaching to individual officers for delays that have occurred, but as even greater delay in opening canals occurred in 1888, and as delay has again occurred in beginning clearance in some talukas for the current season, notwithstanding the efforts that have been made to press on this work, the Commissioner considers that occasion has arisen for his bringing the subject prominently to the notice of Government.

8. The clearance of silt from canals and the repair of their embankments and heads form the chief work of the Irrigation Department in Sind, and on its due execution the agricultural prosperity of the province mainly depends. A very large quantity of such work, scattered over nearly 6,000 miles of canals, has to be done in the six months of each working season, and though it is work of a simple kind, close supervision must be exercised over it while it is in progress, because much of it is lost to sight as soon as water enters the canals, and contractors can and will scamp it unless they are well looked after. It is of great importance, therefore, that clearance should be begun early, and that Executive Engineers and their chief subordinates should be constantly on the move and exercising supervision throughout the working season. Most of the canals are dry in October, and clearance might well be put in hand early in November, but as a matter of fact very little is done before January; the whole time of the establishments during the first two months of the season is taken up in preparing plans and estimates, and arranging other preliminaries required by the departmental rules. The Commissioner is aware that the Superintending Engineer and other officers have done all in their power to bring about an earlier beginning of clearance in the current season, but very little improvement has resulted, and it seems scarcely possible that much more will be obtained unless the preliminaries to the execution of work are simplified. Then again, when works are in progress; Executive Engineers and Overseers are unable to devote the amount of personal attention they would wish to give to their out-door duties of supervision and measurement, as they are constantly occupied in rendering returns and accounts and explanations to the Examiner Public Works Accounts, the preparation of which confines them to their offices. Some special rules for canal clearance work in Sind, as regards preliminaries to the execution of work, as well as the rendering of accounts and returns of work in progress, would seem to be urgently called for. The executive work of the department would also be greatly facilitated, and the money granted for clearance and maintenance would certainly be more economically and profitably spent, if a definite programme of works to be carried out in each working season could be settled some time before the opening of the season. This is impossible under existing arrangements, as the annual grant for clearance and maintenance is not a fixed amount, and the Budget allotments* for expenditure in the latter part of each season are not announced until after the season has well advanced. This subject has already been brought to the notice of Government, and the Commissioner would strongly recommend that the grant for the next five years be fixed at 9 laks of rupees a year, the amount which the late and present Commissioner and the late and present Superintending Engineer for Irrigation are agreed in considering essential for the ordinary clearance and

* Those for 1889-90, *i. e.* for expenditure after 31st March 1889 have not yet been announced.

maintenance of Sind canals. If a fixed annual grant cannot be conceded, the amount to be expended in each entire season should be settled and announced not later than the month of July in each year.

9. In para. 3 of his report Mr. Lambert notes with satisfaction the effect of the protective embankments in Upper Sind in improving the river supply to all canals below Sehwan. With reference to similar, observations in the report for 1886-87, Government expressed a desire (paras. 8 and 9 of Government Resolution No. 48 W. I. 662 of 1888) that the subject might be further studied and investigated. The present report, however, adds little to the information previously before Government. These embankments, which line the right bank only of the river above Sehwan, were practically completed 9 years ago, and the officers of the Irrigation Department must have formed an opinion by this time of their effects on cultivation; and of their success financially. Since their completion a chain of similar embankments has been gradually extended along both banks of the river, from a point a few miles south of Hyderabad and Kotri to the Delta proper. This double line of embankments does not seem to have been built in pursuance of any definitely stated and sanctioned project, but piece by piece, and the Commissioner has not been able to find any clear exposition of the conditions affected by the undertaking or of the objects it was intended to achieve. The artificial raising of the flood level of the Indus described by Mr. Lambert extends over the part of the river walled-in by embankments on either side, as well as for some distance above it. The influence of the tides makes itself felt within the double line of bunds, and impedes the outflow through them of the river when in flood. The rise in the flood level brought to notice by Mr. Lambert did not apparently attract attention until after considerable progress had been made in the Lower Sind embankments, and may very likely be connected with their construction. It seems to the Commissioner that there may possibly be danger here in years of excessive inundation, or on the occurrence of cyclones or unusually high tides during the inundation season, of some disastrous accident like that which happened on the Missisipi under somewhat similar conditions a few years ago. The embankments on both sides of the river have been breached in almost every year since they were built, although as yet they have been subjected to the pressure of only moderate inundations. They have lately been raised to a height above that of the original design, and the level of the floods held between them must now frequently rise to several feet above that of the surrounding country. In this connexion, the Commissioner invites attention to remarks made by Mr. Lambert in para. 79 of this year's report, as follows;—"although considerable sums have been expended on "these embankments during the "last few years, their relative strength has not been increased, *as the highest* "*level of the river has been yearly rising and almost outstripping the im-* "*provements to the bunds.*" There has been no unusual flood in the Indus since the Upper Sind embankments were completed. The lands on the unprotected left bank have enjoyed equal immunity from destructive floods with those on the right bank since 1880, while the lands on both banks were flood-swept several times between 1874 and 1880, and similar floods may again occur in any year.

10. As regards the effect of the Upper Sind embankments on cultivation between Kashmor and Sehwan, the cultivation affected is that of (*a*) the whole of the Upper Sind Frontier District; (*b*) the Sukkur, Larkana, and Mehar Sub-divisions of the Shikarpur District; (*c*) the Dadu, Johi and Sehwan Talukas of the Karachi District. It must be remembered that floods that caused extensive damage have never been of very frequent occurrence, and that the action of all floods is * beneficial to the extent to which they may water lands not supplied by canals, and increase and prolong the duration of the supply in the lower reaches of canals. Before the embankments were made the

* The greater part of the cultivation on the left bank of the river in the Shikarpur District (the Rohri Sub-division) is on lands watered by floods. The revenue collected in these talukas exceeds .5 lakhs of rupees a year.

spill from the river wetted lands for kharif cultivation, and filled shallow depressions that were cultivated with rabi crops when the water dried up, as well as deeper depressions that fed the tails of canals, besides giving a direct supply that was lifted on to lands for rabi cultivation, and providing large stretches of good grazing. This spill is now completely shut out from Kashmor to Sehwan, and the only water that the protected lands regularly receive is the canal supply, which, except in the Upper Sind Frontier District, is no larger now than it was before the embankments were built. The natural consequence is a vast diminution of the grazing area, as well as of the supply to lands that formerly were cultivated on flood water and to the lower reaches of main canals and their branches, and a general drying up of the lands within the protected area.

11. The heavy floods that did the greatest amount of damage to kharif cultivation and threatened the North-Western Railway and the Military Cantonment at Jacobabad swept in through the Upper Sind Frontier District. The Kashmor and Begari Bunds that were built to exclude them were the first Bunds built, and there can be no question as to their usefulness. They have of course shut out water that was useful along with that which did damage, but the canal supply of the Upper Sind Frontier District has been considerably increased since they were constructed and the result in that district of the twofold improvement is a large increase in the cultivated area. The Shahdadpur Taluka, watered by the tails of the Begari and Ghar Canals, is the only part of the District in which the supply is now deficient. The case as regards the protected area of the Shikarpur and Karachi Districts is quite different. Here there has been no increase of canal-supply since the flood-waters were shut out by embankments. The effect of their construction is illustrated in the following statement, which shows the areas under cultivation in the protected talukas of the Shikarpur District in each year since 1873-74, and the average cultivation for the 6 years before, and for the 9 years after, the completion of the embankments.

No.	Year.	Kharif.		Rabi.		Total.		Remissions.			Net Revenue Realizations.			Remarks.
		A.	G.	A.	G.	A.	G.							
1	1873-74 ...	420,337	27	117,888	9	538,225	36	1,10,238	15	1	12,36,064	4	7	
2	1874-75 ...	467,757	34	174,227	30	641,985	24	2,41,818	11	10	11,58,088	10	11	Flood year.
3	1875-76 ...	398,267	27	132,331	9	530,598	36	31,991	9	5	12,20,861	13	11	
4	1876-77 ...	450,018	19	232,891	33	682,910	12	2,13,937	11	10	11,73,289	3	2	Flood year.
5	1877-78 ...	349,882	9	123,757	16	473,639	25	1,970	7	0	12,09,898	5	8	
6	1878-79 ...	482,454	32	247,204	7	729,658	39	35	8	0	14,76,791	7	7	Flood year.
	Total...	2,568,718	28	1,028,300	24	3,597,019	12	5,99,992	15	2	74,74,993	13	10	
	Average for six years...	428,119	31	171,383	17	599,503	8	99,998	13	2	12,45,832	5	0	
7	1879-80 ...	357,434	8	134,358	9	491,792	17	5,858	10	0	12,51,567	2	6	
8	1880-81 ...	419,240	27	81,696	13	500,937	0	14,271	7	0	12,67,729	4	0	
9	1881-82 ...	Details not obtainable.				559,607	37	10,082	5	0	16,16,109	10	0	
10	1882-83 ...	Ditto.				* 619,654	10	71,105	1	0	18,39,313	4	0	* Floods in the
11	1883-84 ...	Ditto.				469,267	8	22,593	12	0	16,18,252	5	0	Shikarpur Dis-
12	1884-85 ...	419,062	2	125,575	0	544,637	2	26,370	10	6	18,41,526	1	6	trict consequent
13	1885-86 ...	391,402	7	94,586	18	485,988	25	1,15,211	11	0	15,91,506	6	0	on the bursting
14	1886-87 ...	427,149	32	85,743	24	512,893	16	96,043	5	0	16,17,341	9	0	of the embank-
15	1887-88 ...	385,824	22	106,371	7	492,195	29	18,620	14	0	15,71,747	2	0	ment at the Ra-
	Total...	2,400,113	18	628,330	31	4,676,973	24	3,80,157	11	6	1,42,15,093	8	0	hija mouth of the Sukkur Canal.
	Average for 9 years total cultivation.	...		...		519,663	29	42,239	11	11	15,79,454	12	10	
	Do. 6 years Kharif and Rabi,.....	4,00,018	36	104,722	0	...		...			...			

12. It will be observed that the total cultivation has fallen from an average of 599,503 acres for the 6 years ending 1878-79 to one of 519,663 acres for the nine years ending 1887-88; and that kharif cultivation has diminished by 28,100 acres and rabi cultivation by 66,661 * acres for the same periods. The actual diminution of cultivation is probably greater than that shown by these figures, for the reason that under the settlements in force in the earlier years of the series, assessment was levied only on areas actually cultivated as ascertained by annual inspection and measurement; whereas, under the settlements recently introduced, whenever any portion of a survey number is cultivated the entire number is entered as cultivated and assessment is levied accordingly. The figures in the statement show areas assessed throughout. As might be expected, the contraction in rabi cultivation is much greater than in kharif cultivation, and it would have been greater than it has been were it not for the large number of wells that have been dug in recent years to supplement the canal supply. The decrease in the area cultivated, again, does not fully represent the losses suffered by cultivators, as the outturn of many fields on which assessment has been paid has been seriously diminished by the insufficiency of the available water-supply. Figures have been added to the statement showing the amounts remitted and the net revenue collected in each year of the series. The remissions granted since the embankments were built show a decrease averaging about Rs. 58,000 a year, and the net revenue realizations have increased by nearly Rs. 3,34,000 a year, notwithstanding the contraction of the cultivated area. The increased realizations are almost entirely due to changes in the settlements and rates of assessment levied, introduced during the last 10 years.

* The discrepancy between the figures showing total cultivation and those showing kharif and rabi cultivation separately arises from the circumstance that details are wanting of kharif and rabi cultivation for three of the series of years to which the total cultivation figures relate.

13. Cultivation returns for the three northern talukas of the Karachi District, which now depends mainly upon the lower half of the Western Nara, will be submitted separately. The results of the shutting out of the floods from these talukas are similar to those above shown for the Shikarpur District. The same cause has operated to diminish the supply in the Manchar Lake, where cultivation has decreased seriously, especially in the last two years.

14. Throughout the whole of the protected area in the Shikarpur and Karachi Districts the supply towards the tails of all main canals and branches is altogether insufficient, and a general displacement and transfer of cultivation has taken place. The water-supply is now used up on lands lying on the upper reaches of main canals and branches, where, since protection has been afforded by the embankments, cultivation has increased. The zamindars holding lands on the lower reaches of canals have suffered greatly, and there is urgent need for expenditure to restore to them the water-supply that they have lost. This displacement of cultivation is a serious matter. In some cases, but not in all, it has arisen from causes beyond administrative control. The Revenue Department and the Irrigational Departmment share responsibility for allowing landholders on the upper reaches of canals to use for the extension of their own cultivation water that properly belongs to lands lower down the canals. Many instances have come to the Commissioner's notice in which cultivators have been deprived, as it seems to him unfairly, of their customary water-supply, through the extension of cultivation, or the substitution of rice for dry crop cultivation, on lands higher up the canals. The attention of Collectors and Executive Engineers has been called to this subject. The rules under the irrigational settlements, which permit zamindars to cultivate without restriction rice or any other crop they please, are partly in fault and will be amended. Under former settlements landholders were not allowed to extend their rice cultivation without permission and it will be necessary to restore the old rule, or to enforce some equivalent precaution.

15. The statement in para. 11 above shows that 80,000 acres in Shikarpur, now barren, were cultivated 10 years ago. To this must be added the area thrown out of cultivation in the Karachi District. The contraction of cultivation in the Shikarpur and Karachi Districts, and in the Shahdadpur Taluka, which was transferred a few years ago from Shikarpur to the Upper Sind Frontier District, that has followed the construction of the Upper Sind embankments does not fall far short of 100,000 acres, and there can be no doubt that the resident population can cultivate quite as much land now as it did before 1880. The wealth and resources of the whole province, and especially of Upper Sind, have been greatly augmented by the large Government expenditure on supplies for the Afghan campaigns, and at Quetta, and on railway works in Sind and Baluchistan, while the growth of well cultivation and the high prices now obtainable for land with a canal supply show how eager the people are to extend cultivation. The average assesment on canal lands in the tract referred to may be taken at between 3 and 4 rupees per acre, so that Government will be quite safe in expending 50 lakhs of rupees, or more if necessary, in improving its water-supply. The Commissioner does not think that any improvement of existing canals will suffice to give with constancy the additional supply required, because these canals draw water from a part of the river that is always shifting ; their heads are eroded in one year and in another obstructed by silt deposits thrown in front of them, and the discharge through them is always precarious. He would strongly recommend Government to take into immediate consideration the construction of a large supply channel taking off from the river above Sukkur, where its course is more permanently established than in any other locality, to feed the whole system of Ghar Canals, and if practicable those of the Western Nara also. Great part of the supply in the Sukkur Canal is now used up on the lands near the river, and the scheme should embrace the feeding of the tails of that canal. There is a very much better chance of a permanently profitable investment here than in the construction of new feeders to the Ghar and Western Nara drawing their river supply from any place below Sukkur. The supply of any new feeders constructed there will be just as precarious and unreliable as that of the present channels feeding the Ghar and Western Nara Canals.

16. As regards the effect of the embankments on cultivation *below* Sehwan. Although the rise in the inundation level noticed by Mr. Lambert has raised the head of water in all canals below that town, no great increase of cultivation has taken place upon them as yet. In the Hyderabad District there is every prospect of a very large increase after the completion of improvements to canals in the Hyderabad and Fuleli Canals Divisions of which a beginning has now been made, but there is no such prospect in the Karachi District, on account of the scantiness of the population and the unhealthiness of the Delta talukas.

17. Speaking of the embankments generally, the Kashmor and Begari Bunds, and those for some distance below Sukkur, as well as others protecting particular points on the river, are no doubt works of the greatest utility ; but the question whether it is safe and otherwise expedient to maintain a continuous chain of embankments along the whole course of the river through Sind would seem to need very careful investigation. The fact that this work has been carried out without sufficient examination of all the conditions involved has already been noticed. The Fuleli canals and those in the Karachi District were not designed or constructed to carry the additional head of water forced into them by the rise in the flood-level of the river brought about by the construction of the embankments, and large expenditure will yet have to be incurred in raising and strengthening their banks, and in providing drainage channels and escapes for the outflow of their surplus waters, as well as on strengthening the river embankments, if the present head of water is maintained in the river. The remarks made in paras. 79 and 80 of Mr. Lambert's report regarding the

flooding of the Delta Talukas and the need for strengthening the banks of the Baghar canal and for additions to the river embankments should be read in this connexion.

18. The average expenditure on river embankments during the last six years, as shown in para. 14 of Mr. Lambert's report, exclusive of the cost of supervising establishments, and the interest on the original cost of construction, has amounted to Rs. 1,90,000 a year. The heavy outlay on their maintenance has necessitated a corresponding curtailment of expenditure on the clearance and repair of canals, and is one of the causes of the unsatisfactory condition of the canals of the Hyderabad District. The charges on account of *abkalani* establishment employed on these embankments, are enormous and have been increasing, although apparently they ought to have been reduced as embankments constructed in the earlier years became consolidated. The Commissioner is inclined to the opinion that the embanking of the river generally has been overdone and specially so in Lower Sind, and that the question of the maintenance of the embankments in the Delta Talukas should be considered not merely with reference to their own cost and the risks attendent on them, but also with reference to the expenditure on improvements to canals and drainage that their maintenance will necessitate and the revenue results that the entire expenditure may be expected to produce. The Upper Sind embankments should also be examined and, if practicable, regulators should be built in them to admit spill-water from the river at places where it can be profitably utilised for grazing and rabi cultivation. Some of the depressions through which flood-water used to enter in former years might apparently be put to good account in this manner.

19. With reference to the remarks in para. 6 of Mr. Lambert's report regarding the grant of remissions, it should be stated that remissions are never granted when a cultivator who has only sufficient water to grow a dry crop—bajri or juari for instance—speculates and tries to grow rice, or any other crop that requires a superior supply. They are only granted in cases in which cultivation reasonably attempted has failed through insufficiency of the water-supply or has bas been injured by floods or other causes beyond the cultivator's control.

20. The figures given in paras. 7 and 8 of Mr. Lambert's report are for the financial year ending March 31st, and on that date, as explained in para. 5 of the Commissioner's forwarding remarks on the report for 1886-87, several instalments remain to be received. The collections on account of bakaba in the revenue year show an increase of Rs. 4,291-4-11 over those of the previous year. The miscellaneous revenue is collected by the Revenue Department direct, and by the Mukhtyarkars on the requisition of the Executive Engineers. The decrease is mostly in the Eastern Nara and Fuleli Divisions and is principally due to decreased receipts from farms of fisheries in canals and dhands. The following statement shows the state of outstanding balances at the end of the revenue year 1887-88 as contrasted with those of the previous year :—

No.	District.	Outstanding Balances of last year 1886-87 (*i.e.*, 1st August 1887).	Revenue for 1887-88.			Total Revenue for collection (*viz.* total of Columns 3 and 6).	Total Collections.	Outstanding Balances on 1st August 1888.	Remarks.
			Gross Revenue.	Deduct Remissions.	Net Revenue for collection.				
1	2	3	4	5	6	7	8	9	10
1	Kalat Territory ...	52,475 6 0	64,083 7 4	1,255 0 0	62,828 7 4	1,15,303 13 4	82,052 7 11	33,251 5 5	
2	Upper Sind Frontier ...	114 15 0	414 5 0	.....	414 5 0	529 4 0	425 5 0	103 15 0	
3	Shikarpur ...	353 6 0	12,467 0 0	.....	12,467 0 0	12,820 6 0	12,809 5 0	11 1 0	
4	Hyderabad ...	236 4 6	34,109 10 0	.....	34,109 10 0	34,345 14 6	34,241 15 6	103 15 0	
5	Karachi ...	117 0 0	6,446 12 0	.....	6,446 12 0	6,563 12 0	6,468 9 0	95 3 0	
6	Thar and Parkar ...	.....	636 0 0	.....	636 0 0	636 0 0	636 0 0	.....	
	Total ...	53,296 15 6	1,18,157 2 4	1,255 0 0	1,16,902 2 4	1,70,199 1 10	1,36,633 10 5	33,565 7 5	
	Revenue for 1886-87 ...	87,109 6 0	1,23,642 0 0	169 13 0	1,23,472 8 0	1,85,639 5 0	1,32,342 5 6	53,296 15 6	
	Deduct amount written off as irrecoverable in Kalat Territory ...	24,942 4 0							
	Net amount ...	62,167 2 0							
	Increase ...	.....	.....	1,085 3 0	.....	.....	4,291 4 11	.....	
	Decrease ...	8,870 2 6	* 5,484 13 8	.....	6,570 0 8	15,440 3 2	.....	19,731 8 1	

* Decrease owing to decreased revenue (Rs. 2,941 0 8) from lands in Kalat territory, the arrangements regarding which are not in the hands of the revenue officers in Sind, and to decreased revenue in the Hyderabad and Karachi Districts, owing to lapse of and less cultivation in jagirs.

The outstanding balances are chiefly an account of hakaba on lands in Kalat territory. The Government of Bombay referred to this subject in para. 15 of their Resolution No. 48 W. I. 622 of 27 March 1888, and the Government of India in their Resolution No. 96 I., dated 22nd May 1888, remarked that "matters connected with Irrigation Revenue and Remissions" were not in a satisfactory condition in Kalat territory. See also correspondence ending with this office No. 3244 of 12th September 1888.

21. The Commissioner fails to follow Mr. Lambert in the remarks made in the 9th para. of the report regarding the two classes of political pensioners. It is hardly correct to speak of the Jagirdars of Sind as "Imperial Pensioners." A few of them received jagirs in lieu of pensions after the conquest, but the majority of them are properly speaking privileged landholders; and in some cases they or their predecessors in title originally excavated canals now controlled by the Irrigation Department and were in possession of their estates and water-supply before Sind became a British province. In such cases it would be by no means easy to make the adjustments suggested; still, the Commissioner has no doubt that in some instances, notably in the case of jagirs in the Hyderabad District, additional contributions in the shape of enhanced hakaba may be possible, and this subject is engaging his attention.

22. The balances reported in Mr. Lambert's para. 11 agree with those given by the Collectors and Deputy Commissioners as outstanding at the end of the revenue year. In the Upper Sind Frontier District postponements were granted in the Shadadpur Taluka on account of deficient water-supply, and there is a disputed item due by Mazari Chiefs residing in the Dera Gazi Khan District of the Panjab, who refuse to pay until the terms on which they are to be allowed to hold land on the Frontier of Upper Sind are settled. This matter is before Government. In Karachi, postponements were granted by the Collector up to December 1888 and April 1889, owing to failure of crops, and there are some items due by the Manager, Incumbered Estates. In Shikarpur and Hyderabad the balances are due principally by the Manager, Incumbered Estates.

23. The diminution in remissions granted, reported by Mr. Lambert in para. 12, is very satisfactory. The largest remissions for the year occurred in the Begari, Ghar, and Karachi Divisions. Those in the two former were mainly due to insufficiency of water-supply in the tails of the canals, and those in the Karachi District to breaching of the river embankments.

24. The Commissioner considers it unnecessary to follow Mr. Lambert in his detailed observations on the working of the various canals, but he will state his opinion on this subject generally, as well as with respect to several details noticed by the Superintending Engineer on which comment seems desirable. The canals in the Upper Sind Frontier District are in good order, and do the full work required of them, except in the Shadadpur Taluka, the irrigation of which is to be transferred from the Begari to the Sukkur Canal when the improvements suggested for the latter are carried out. The same may be said of the Eastern Nara Canals. The condition and management of the canals in these two divisions reflects, in the Commissioner's opinion, very great credit on the Executive Engineers who have long held charge of them, Messrs. J. A. Coghlan, and J. Young. An additional water-supply for part of the Upper Sind Frontier District is immediately available if the head regulator on the Sind Dora (where it passes through the Kashmor Bund) is worked. Inquiries are being made with a view to the early utilisation of this supply, if practicable. The few canals in the Shikarpur Division are in fair order, and the irrigational condition of the division is creditable to Mr. Single the Executive Enginer in charge, though undue delay occurred in opening the canals in the year under report. The canals in the Ghar Division, excepting the Sukkur Canal, have not worked well for some years, owing to constant changes in the river. They also were not opened soon enough in the

year under report. The supply they carry is quite insufficient to meet the present requirements of cultivation. An increase in the rabi supply admitted into the Sukkur Canal is very desirable, and apparently might be provided at very moderate cost by increasing the discharge capacity of the regulator. The deficient supply in some branches of the Ghar has been supplemented at different times by cutting feeders to them from the Western Nara. This abstraction of water from the Nara has of course reduced the supply in the lower part of that canal, and has caused a contraction of profitable cultivation in the Karachi District, causing loss and hardship to zamindars who had a better claim to the supply. The Commissioner entirely agrees with Mr. Lambert as to the expediency of placing the whole of the Western Nara under the charge of a single Executive Engineer.

25. The canals of the Hyderabad District, speaking generally, are not in a satisfactory state. Those in the Hyderabad Canals Division are low-level "lift" canals, and sufficient attention has not been paid to them for some years. Few, if any of them, have been cleared to their bed stones or to their full width, and the heads of some of them are in bad order. The expenditure made on them from the clearance grant for the last five years is shewn in the margin. It will be noticed that the expenditure on clearance has materially decreased year by year, while that on establishments has increased from Rs. 18,487 in 1882-83 to Rs. 35,719 in 1886-87. The charges under the head "Repairs" relate mainly to "jungle cutting", which is work of a very unprofitable nature and might well be postponed when money is wanted for silt clearance. The charges for jungle cutting have been unusually heavy in this division, and they, as well as establishment charges, ought to be reduced considerably. There is great need for increased expenditure on these canals. They seem to have been viewed with disfavor by the Irrigation Department, because they are "lift" canals and their returns per acre irrigated are lower than those of "flow" canals; but the population cultivating from them is as industrious, and the cultivation is as good, as any in the province. The cotton grown in this division is the best in Sind. There is no lack of resident population, and any amount of additional labour wanted can be obtained from Jeysalmir and Jodhpur, from which States a considerable immigration has already set in to the lands under the Eastern Nara Canals The only thing necessary to lead to a large extension of cultivation here is improvement of the existing canals. Until this is effected, no good use will be made of the improved river-supply that is now available to them. The need for improvement is greatest in the Sakrand, Shahdadpur, Hala, and Tando Allahyar Talukas, where cultivation has fallen off. Small improvements made last season at the Collector's instance in the Naushahro Sub-division produced very good results and paid for themselves at once. The Executive Engineer in charge of this Division and most of his chief subordinates live in Hyderabad, outside its limits and at a long distance from their work. The Commissioner thinks that the Executive Engineer's headquarters should be transferred from Hyderabad to Daulatpur, where a good bangalow is available, or to some other place in the centre of the Division.

Years.	Clearance.	Repairs.	Establishments.
1882-83	1,20,914	11,210	18,487
1883-84	1,16,416	9,733	29,048
1884-85	93,600	20,027	31,361
1885-86	74,349	20,724	21,870
1886-87	77,344	21,326	35,719

26. The present water-supply in the Fuleli is perhaps the finest in the province, and after it has been brought under control by improvements now begun and the lands towards the tails of the canals have been reclaimed by clearing the silted up drainage channels, a very large expansion of cultivation and of revenue will be apparent. For several years previous to the year under report the clearances on the Fuleli canals were altogether insufficient and many zamindars have suffered very severely from the swamping of their lands by the recurring overflow of canals whose beds and tails were blocked with silt. It will be necessary for some time to come to devote a considerable share of the clearance grants to the canals in the Fuleli and Hyderabad Canals Divisions to make up for deficient expenditure on clearance in-

the past. Expenditure is also required to fit the Fuleli Canals to carry the increased volume of water now poured into them and for the construction of regulators to distribute the supply. Government have recently allotted funds for the construction of a regulator at the head of the Fuleli main canal, and the Commissioner trusts that they will make further grants for the provision of additional regulators and other improvements needed, as he is satisfied that the expenditure will be immediately profitable in a marked degree. Money for these works cannot be spared from the grants for maintenance and repairs and the cost of their execution would not form a proper charge against those grants. A well digested project for the gradual improvement of the Fuleli Canals to suit the changed condition of their river supply should be drawn up and submitted for sanction after full consideration of all the conditions to be served, and each approved work should be executed in the order of its importance as decided on in consultation with the Revenue officers. The total expenditure, ordinary and special, on these accounts will amount to several lakhs of rupees, and it should be made under proper sanction and systematically. Clever men and capitalists of Hyderabad have grasped the situation and have acquired rights to water in favorable positions high up the canals which should not be extended beyond their just limits. There will be many claimants to the improved supply, and the claims of those zamindars whose lands have been flooded and thrown out of cultivation by no fault of their own should receive the first consideration. Special attention should be paid by the Executive Engineer and the Collector, whilst the improvements are in progress, to the private watercourses through which water is drawn from the canals. Reference is made to this subject in another sense in para. 74 of the Superintending Engineer's report. Since the canals have fallen into their present surcharged condition, the Irrigation officers have encouraged landholders to enlarge the heads of their watercourses and to keep them constantly open and to allow water to flow continuously over rice crops and to make new openings to lead water on to uncultivated lands, in order to reduce the pressure on the canal banks and prevent their breaching. All these watercourses have been shewn in the maps prepared by the Survey Department for the settlements just made in the Fuleli Talukas, and unless the matter is taken in hand and dealt with promptly, unfounded claims to water-supply and complications are likely to ensue hereafter. It is very desirable that the number of private watercourses should be reduced, as also the dimensions of the heads of many of them. The Collector and the Executive Engineer should do all in their power to encourage zamindars to build masonry heads to them, and the Collector should grant loans freely for this purpose. Another matter connected with the Fuleli water-supply that requires attention is the use made of it on jagir lands and the hakabo paid for it. There are large jagirs on the Fuleli and the jagirdars use more water than they pay for. They are only required under the Hakabo Rules to pay for water irrigating cultivated land, and they pay nothing for land wetted but not cultivated. The cultivated area is ascertained each year, and Re. 1 per acre is charged for the water-supply. Their cultivators let water flow continuously over their rice fields whenever they can get it, for the sake of the silt that falls and fertilizes the soil, and the surplus water is led off on to low-lying lands that grow grass and other useful products. The jagirdars should be required to build regulators at the heads of all their canals which should be worked under the orders of the Executive Engineer, and those who use a continuous supply for rice cultivation should pay a higher rate of hakabo and something should also be charged for water used on lands that are not cultivated.

27. The question of levying some payment for the use of Fuleli water irrigating zamindari and unoccupied grazing lands has been noticed by Government, and the subject has received attention from the Collector of Hyderabad and the Commissioner. Most of these lands are in the flooded portions of the Tando Bago, Badin and Guni Talukas, and many of them were formerly cultivated and will be cultivated again when the canals are put in order. Colonel Trevor is averse to the levy of grazing fees at present, on account of the impoverished state of the cultivators who own many of the

cattle and the hardships that they and the zamindars have suffered by the flooding of their lands, and the Commissioner agrees with him to a certain extent. But the question should soon now be taken up in earnest, as the *Haris* (labouring cultivators) are becoming demoralized and inclined to neglect cultivation for breeding and grazing milch cattle, which affords a very easy means of livelihood when grazing is free.

28. The condition of the canals in the Karachi District may be described as good in the Delta Talukas and unsatisfactory in the talukas above Manjhand. Clearance has been neglected on the Western Nara, as shown in para. 77 of Mr. Lambert's report; but the silting of the Aral and other canals connected with the Manchar Lake is due to causes practically beyond control. A very large expenditure has been incurred on canals and river embankments in the Karachi District for some years past, but the results obtained have been altogether incommensurate with the outlay, as is shown by the figures given in para. 81 of the report. The bulk of the money has been spent for the benefit of the Delta Talukas, whose population is scanty and thinned by fever and frequent outbreaks of cholera and other epidemic disease. The average charges against the canal revenue of these talukas for the last five years probably exceed 80 per cent. of the receipts, and there is no reasonable expectation, in the Commissioner's opinion, of any large increase of cultivation occurring in them even if expenditure at the present rate is continued. Drainage works are now talked of, and their construction would doubtless tend to improve cultivation and probably the sanitary condition also, but their cost will be considerable. These talukas would probably have returned a much larger net revenue than they do at present, if they had been treated in the same way as the Rohri Sub-division and left to depend mainly on spill-water for their irrigation. The whole position in these talukas as regards present and prospective expenditure and realizations and the risks run in the attempt to retain the river floods at a high level between the double line of embankments referred to in paras. 9 and 17 above needs careful examination, and the Commissioner thinks that the Superintending Engineer should be called on for a full report on the subject. If expenditure in these talukas can be curtailed, the money set loose can certainly be expended much more profitably elsewhere.

29. The question raised in para. 38 of the report regarding the assessment of dubari cultivation on the Sukkur Canal is under consideration. There is a difference of opinion as to the facts of the case, and as to the remedy to be applied. It appears that the greater part of the 18,348 acres reported by the Superintending Engineer as cultivated with both kharif and rabi crops was irrigated in the kharif season only, and received none of the rabi supply; much of it is rice land on which a second crop was raised on the moisture remaining in the soil after the rice crop was harvested. For such poor rabi cultivation as this the rate settled by Mr. Erskine is probably as sufficient in the case of the Sukkur Canal as Mr. Lambert admits it to be for other canals. For lands for which both kharif and rabi supply is taken the rate is certainly insufficient, and the question pending settlement is as to the treatment of such twice-watered lands. The Commissioner is inclined to think that the best immediate solution is to refuse a rabi supply to lands cultivated with kharif crops, as both the kharif and the rabi supply at present available in the canal are insufficient to meet the whole demand for water, and what there is ought to be distributed as evenly as possible. Mr. Lambert has not noticed the extent of the rabi supply discharged through the Sukkur canal or the area that it sufficed to irrigate.

30. Rice cultivation on the Ghar canals, to which reference is made in paras. 39 and 41 of the report, has fallen off considerably in the last few years, and in the year under report juari was largely cultivated on rice lands. The areas under rice and juari respectively in each of the last 10 years are shown in the margin. In the Larkana Taluka, where the revised settlement is still in force, the insufficiency of the canal supply has pressed heavily on zamindars holding lands assessed at rice rates, who have had

	Rice.	Juari.
1878-79...	151,127	24,848
1879-80...	157,496	10,808
1880-81...	170,342	24,548
1881-82...	133,424	34,863
1882-83...	146,638	49,893
1883-84...	145,617	13,568
1884-85...	153,148	20,752
1885-86...	141,787	11,292
1886-87...	128,889	28,230
1887-88...	44,539	81,089

to choose between leaving their fields uncultivated and growing inferior crops. If the juari crop had not been an unusually good one, and if prices of produce had not ruled at exceptionally high rates, in the year under report, the remissions on these lands would have been heavy.

31. The special clearance on the Gul Mahamedwah branch of the Western Nara, noticed in para. 43 of the report, led to new cultivation on lands commanded by the Ghar. The revenue thus obtained in the Shikarpur District was realized at the cost of the Karachi District, and the diversion of the water-supply was unfair to landholders on the lower part of the Western Nara Canal, who were deprived of water to which they had a distinctly prior claim. Another and larger diversion of water from Nara to Ghar lands has resulted from special clearances in the Arthurwah, begun in the year under report and finished before the inundation of 1888. The Arthurwah is a branch of the Western Nara, and the special clearances, on which Rs. 26,000 were expended, included the widening of the regulator at its head, the construction of a second regulator half-way down it, and the excavation of some three miles of new canal to join it with the Chilowah, a branch of the Ghar insufficiently supplied from the main canal. This work should not have been executed in presence of the known insufficiency of the supply in the lower part of the Western Nara, and it is not a work that should have been executed at the cost of the Maintenance and Repairs grant. Increased attention should be paid in carrying out new works and improvements to the customary rights of landholders in the matter of water-supply, and the attention of Collectors and Irrigation Officers has been drawn to this subject.

32. The results reported by Mr. Lambert in para. 48 for the Eastern Nara canals are most satisfactory and encouraging. The Commissioner understands that the water drawn from the river through the existing supply channel at Rohri is now doing nearly all the duty that can be got out of it, and that some expansion of the river supply will very soon become necessary. A branch taking off from the Jamrao Dhand to water the eastern part of the Sakrand and Shahdadpur talukas of Hyderabad is very much wanted, and would pay as well as any of the canals of the system. Part of this tract was watered from the Nara some years ago, but the supply was cut off when the works for the new canals were undertaken. There is every prospect of a large increase of cultivation and of revenue in the Nara Valley, and no want of labour for cultivation. The great want of the district is railway communication with Hyderabad, in order to give its cultivators a good market for their produce. A project for a cheap feeder-line from the Nara river to the North-Western Railway is before Government.

33. The Commissioner cannot admit the justice of the remarks made by the Superintending Engineer in para. 74 of his report attributing the numerous breaches of canal banks that occurred in the Fuleli Division to the neglect of zamindars and cultivators to keep in proper order the heads supplying their private water-courses. These accidents and the damage they occasioned were mainly the result of insufficient clearance and the silting up of the tails of the Fuleli Canals, coupled with the increased volume of water poured into the Fuleli Main Canal by the rise in the flood level of the river, to which reference has already been made. The construction of the regulator at the head of the Fuleli lately sanctioned, and the clearance of the tails now in progress will diminish the risk of breaches in future years.

34. The project for a new feeder to the lower part of the Western Nara, referred to in para. 77 of the report, has been submitted to Government, with a recommendation that the condition of the whole canal should be thoroughly investigated before decision is come to regarding the steps to be taken for improving its supply. The examination on which the project is based extended only to that part of the canal which is in the Karachi District.

35. The Commissioner has not supported the project for improving the Kalri canal mentioned in para. 80 of Mr. Lambert's report, because he does not think it likely to lead to any real extension of cultivation, as full use is not made of the supply already afforded by canals in the Delta talukas.

36. The present report, following the scheme of former reports, contains full information regarding the revenue results obtained in each Canal Division, but few details regarding the progress of cultivation. Fluctuations in revenue collections are dependent in great measure on settlements in force and rates of assessment levied,* and conclusions as to the condition and working of canals cannot safely be founded on a consideration of their revenue returns alone. It seems desirable that in future reports cultivation returns for each Canal Division, and for each important canal, should be added for the same series of years for which revenue figures are given. The following form is suggested as convenient for the cultivation returns :—

* See the table in para. 11 above, and remarks in para. 12.

Years.	Cultivation receiving a perennial supply.		Kharif.										Rabi.						Total cultivation.	
			Rice.		Juari.		Bajri.		Other crops.		Total Kharif.		Wheat.		Other crops.		Total Rabi.			
	A.	G.	A.	G.	A.	G.	A.	G.	A.	G.	A.	G.	A.	G.	A.	G.	A.	G.	A.	G.

37. It is desirable also that a clear and comprehensive account should be given in these reports, or separately, of the manner in which the grants for maintenance and repairs and for extensions and improvements are applied and expended. The average expenditure under these heads of the last six years, as shown in para. 13 of the report, has amounted to more than Rs. 11,00,000 a year, but the only information published regarding it is that contained in the brief summary given in the General Administration Report prepared in the Public Works Secretariat. The Superintending Engineer should give an account of his stewardship, and the operations of the Department should be laid open to examination and criticism.

38. The grants made, large as they are, are admittedly insufficient to allow of the simultaneous execution of every desirable improvement. The money available must be spent economically, and it is most necessary that canals should be cleared to their full depth and width, that their banks should be repaired, and that their heads should be put into the best working order possible, before expenditure is devoted to other work of less immediate utility. If this principle is to be observed, a clear account of work executed and expenditure made must be rendered. Each canal has its sanctioned section, and its condition with reference to that section should be reported yearly and explanations should be given of deviations from the standard. A full description of the work executed in each Canal Division should be given, and the expenditure incurred should be classified under some such heads as the following :—

1. Silt clearance.
2. Repairs to canal embankments.
3. Clearance and improvement of canal heads,

4. Jungle-cutting and removing fallen trees.
5. Inspection path-ways along the sides of canals.
6. Construction and repairs of inspection bungalows.
7. Construction and repairs of canal chowkies and tool-houses.
8. Regulators and sluices.
9. Sloping canal banks and cutting off angles.
10. Establishments charged against works. The expenditure under this head should be shown in clear detail—the rates of pay allowed, the number of men employed at each rate, the periods of their employment, and the manner of their employment, should be stated, and increases and decreases should be shown and accounted for.

Corresponding details should be given regarding expenditure on river embankments in each Canal Division. It will then be possible to contrast the expenditure made in the several Divisions and to compare it with the results obtained. Good management, or the reverse, on the part of the Divisional Officers will be apparent, and improvements effected in one division may be extended to others.

39. Some figures of expenditure are given in paras. 13 and 14 of Mr. Lambert's report, but they are not in sufficient detail for administrative or critical purposes, and while they nominally show the expenditure on "Establishments" separately from that on "Works", they do not show the actual outlay under either head. The Establishment charges entered are only those on account of the Permanent Establishment of Executive Engineers, Supervisors, Overseers, Clerks, &c., &c., but other large charges are also incurred on account of Establishments and are included under the head "Works." The following statement exhibits the actual outlay on Works and on Establishments respectively for five of the years treated by Mr. Lambert. Figures for the years 1881-82 and 1887-88 are not in the Commissioner's possession.

Year.	Works.	Establishment.			Total expenditure.
		Permanent.	Charged against works.	Total.	
1882-83 ...	6,47,604	2,22,036	2,21,387	4,43,423	10,91,027
1883-84 ...	6,42,586	2,14,128	2,36,230	4,50,358	10,92,944
1884-85 ...	6,10,523	2,13,717	2,43,234	4,56,951	10,67,474
1885-86 ...	5,72,872	2,48,524	2,58,276	5,06,800	10,79,672
1886-87 ...	5,54,157	2,74,930	2,73,765	5,45,695	10,99,852
Total...	30,27,742	11,70,335	12,32,892	24,03,227	54,30,969
Average...	6,05,548	2,34,067	2,46,578	4,80,645	10,86,193

The establishment charges thus amounted to 79 per cent. on the outlay for works and, considering that much of the work done was earth excavation and embankment executed under contract, they appear enormous, after making allowance for the *abkalani* establishments employed dur-

ing the inundation season to watch embankments. It will be observed that while the outlay on works has steadily diminished from Rs. 6,47,604 in 1882-83 to Rs. 5,54,157 in 1886-87, that on establishment has progressed year by year from Rs. 4,43,423 to Rs. 5,45,695. Other instances brought to notice in the foregoing remarks indicate that there is room for improvement in the application of the Maintenance and Repairs grants, and the Commissioner thinks that cause has been shewn for the submission of a more detailed account of the administration and expenditure of the Department than has hitherto been supplied. The Revenue officers, who are in the best position to ascertain and represent the wants of the people in the matter of water-supply and are responsible for the working of the revenue settlements, the maintenance of which depends on irrigation, should have a greater voice than has been allowed them in directing the expenditure of the maintenance grants. The work to be executed in each season should be settled in consultation between the Revenue and Irrigation officers, and the programme settled on should be carried out.

40. A large share of the maintenance grants has been devoted for the last 10 years to the protective embankments along the river, and the Commissioner concurs in the opinion expressed in para. 14 of the report as to the advantage of setting free a portion of that outlay for expenditure on canal clearances, which, as Mr. Lambert says, "are invariably attended with increased cul-"tivation and revenue." He also concurs in the recommendation made by Mr. Lambert in the same para. that the North-Western Railway should be required to contribute its share of the cost and maintenance of the Upper Sind river embankments, which were doubtless constructed and are maintained partly for the protection of that railway against floods.

41. In the above imperfect review the Commissioner has found occasion to comment in an unfavorable sense on some of the work of the Irrigation Department in Sind, especially in the matter of the direction of expenditure of the Maintenance and Repairs grants. His attention was specially attracted to this subject by the circumstance that his predecessor, Mr. Erskine, reported to Government shortly before he left Sind that some of the revenue settlements made in the last few years could not be maintained unless more money was spent on the clearance of canals, and that not long after he had taken up the office of Commissioner he was obliged to submit a similar representation. Government were pleased to accept the recommendations submitted by the Superintending Engineer and supported by the Commissioner, and made a liberal additional grant at the beginning of 1888 that has sufficed to improve the condition of many of the canals. But much remains to be done, and no prospect has been held out by Government of any permanent addition to the clearance grant, while under present financial conditions no increase can be immediately expected. It is therefore essential that irrigational expenditure should be economised in every way possible, and that it should be confined to works that are necessary for securing water-supply to lands the holders of which have a rightful claim to water, until those claims are satisfied. It was necessary that an examination of the expenditure of past years should be made, in order to discover items in which economy may be exercised, as well as items the execution of which will bear deferment. Some of the criticisms offered by the Commissioner accordingly refer to conditions and circumstances with which he was not personally conversant, and he would not have referred to them if other means had been open to him of forming conclusions and suggesting improvements that seem to him to be called for. He desires to acknowledge the ready and cordial assistance he has received from the Superintending Engineer in this inquiry, as well as in all other matters, and the excellent work done by Mr. Lambert and the officers of the Sind Irrigation Department during the year under report.

C. B. PRITCHARD,
Commissioner in Sind.

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1888-89.

[Price—8 Annas.]

BOMBAY BRANCH
OF THE
Royal Asiatic Society.
CLASS

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1888-89.

INDEX.

	Pages.
General review of the results for the whole Province	1 to 24
Begári Canals	24 & 25
Shikárpur Canals	25 & 26
Ghár Canals	26 to 28
Eastern Nára Canals	28 & 29
Hyderabad Canals	29 & 30
Fuleli Canals	30 to 32
Karáchi Canals	32 & 33
Table I.—Cultivation and water share of net consolidated revenue for 1888-89 and three previous years...	35
Table II.—Area of cultivation and Canal revenue for 1888-89 and five previous years	35
Table III.—Area of cultivation and Canal revenue for 1888-89	36
Table IV.—Revenue expenditure on new works, maintenance and repairs and revenue and collection charges in the Civil Department for 1888-89 ...	37
Table V.—Cultivation, Canal revenue and expenditure for 1888-89 as contrasted with three previous years	38
Table VI.—Direct and indirect receipts of Canal revenue for 1888-89 ...	39
Table VI.-A.—Actual direct and indirect receipts of Canal revenue in 1888-89 as shown in General Revenue Accounts of Executive Districts prepared by the Examiner, Public Works Accounts	40
Table VII.—Area of cultivation and consolidated revenue for 1888-89 ...	41
Table VII.-A.—Comparative statement showing increases or decreases under heads Kharíf and Rabi and Irrigation share of net consolidated assessments for 1887-88 and 1888-89	42
Table VII.-B.—Statement showing receipts from sale of occupancy rights in waste or other lands not belonging to the Irrigation Capital Account Works, but directly benefited by their construction, for the year 1888-89	43
Table VIII.—Discharges of certain canals, areas of crops of different kinds irrigated, and duty of water per cubic foot of supply for Kharíf season, 1888 ...	43
Table IX.—Rainfall in the Province of Sind for 1888-89	44
Memorandum showing amount of loss to canals on account of difference between assessments of water rates on Jághír lands and the assessments at the ordinary rates in force for Government lands	45
Statement No. I-B.—Capital account of Irrigation works in Sind for and to end of 1888-89.	46
Statement I-C.—Statement showing financial results of Irrigation works in Sind for the year ending 31st March 1889. Realizations under main heads of revenue and working expenses	47
Statement II-C.—Statement showing financial results of Irrigation works in Sind based on actual receipts. Principal results of operations for the year ended 31st March 1889	48
Statement III.-C.—Demands and realizations during the year 1888-89 in Sind ...	49
Statement IV.-C.—Statement showing the financial results of Irrigation works in Sind for the year 1888-89 based on assessments of the year. Principal results and operations for the year ended 31st March 1889	50
General abstract of financial results of Irrigation works in Sind for and up to the close of 1888-89	52 & 53
Series of readings on the Bukkur and Kotri gauges	54
List of highest readings on the Bukkur and Kotri gauges for ten years from 1879—1888	55
Chart showing readings at Kotri and Bukkur gauges for 1888	
Index map of the Province of Sind	
Letter from the Superintending Engineer in Sind, No. 5358, dated 22nd December 1889	56
Memorandum from the Commissioner in Sind, No. 559, dated 14th February 1890.	56—62

ANNUAL REVENUE REPORT

OF THE

IRRIGATION DEPARTMENT IN SIND

FOR 1888-89.

The Indus at Bukkur rose to a height of 11′ 2″ on the 23rd of May, but went down again to 8′ 11″ on the 28th of the same month. This early rise was of no use for cultivation, and was more detrimental than otherwise to the canals, as it caused silt to settle in their heads, and all which were open ceased to flow with the exception of the large main feeders. The river again began to come up on the 29th, and on the 5th of June reached 12′ 6″, when all the canals were again flowing. On the 14th a most unfavourable fall commenced, and did not stop until it arrived at a gauge reading of 7′ 11″ on the 25th, when again most of the canals ceased to flow. The effect of this fall was very detrimental to some of the canals, for, as the water fell and the velocity was checked, a heavy deposit of silt occurred, which, if the river had not kept fairly well up in the late season, would have caused shortness of supply in most of the canals, and prevented many of the shallow ones having any supply at all. During the time the height of from 11′ to 12′ was maintained, which was for about twelve days, and before the dangerous fall commenced, there was a full supply for seeding and ploughing purposes, so that cultivation for the season had a good start; and although the height of 12′ was not again reached until the 6th of July, there were no complaints for want of water for seeding purposes. From the 6th of July the inundation, although not high, may be classed as a very steady one up to 15th of August, on which date it reached a height of 14′ 3″. There were fluctuations between these dates, but none of any great consequence. The water at the gauge ran down to 10′ 10″ on the 14th of July, but with that exception it kept well up to and above 12′ until the 20th of August, when it fell to 11′ 4″; but this fall fortunately only lasted a short time, as the water again rose until it reached its maximum for the season of 14′ 5″ on the 29th. The fall for the season then set in; but it was gradual, and did not commence to affect the canals very generally before the 9th or 10th of September. The Kotri gauge this year did not show the usual fluctuations and differences, as in flood years, between it and the Bukkur gauge, and except the ordinary differences indicated by its parallel rise and fall within intervals of a few days, there is nothing remarkable about it to observe upon. The very parallel and equal working of both gauges, however, shows that there was very little spare water coming down the river, and that the ordinary river channel and the canals carried it off. There was no remarkable overflow in the upper reaches, therefore no back waters, or storage of any kind, to keep the head in the lower river up, while the initial supply was decreasing at Bukkur.

2. It is worthy of notice that such a low inundation as the one under report has not occurred for seven years, and, with the exception of 1881, its maximum height is the lowest of a long series of years. In 1881, it can be perceived from the table of gauge readings for ten years in the Appendix that the maximum height reached was 14′ 5″, or the same as in the year under report, which is shown on the chart attached. The maximum in 1881 was reached on the 25th of June, and in 1888 on the 29th of August. Taking the mean readings of the rises and falls in 1881 from the 1st of June to the 10th of September, the height of the mean supply for that season was only 12′ 1″, while in 1888, taking the same dates, the mean supply for the season was 12′ 3″. From this comparison it can be seen that the quantity of the supply was much the same; and although the inundation of 1881 is only classed as "favourable," the supply of 1888 must be classed as good when compared with the excellent results it has produced, which will be shown as this report proceeds. In further

comparing these two seasons, which are so alike as far as the quantity of water discharged is concerned, a great difference in favour of 1888 will be perceived in the returns of both the kharif and rabi crops. This can be accounted for by the difference in the time at which the river was at its highest, as a high rise in the early season is not nearly so beneficial as when the maximum rise takes place in the late season. In 1881 the maximum height was reached on the 20th of June, when a rapid fall set in; and although the fall did not last long, the height of water afterwards was not ever much above 13′ during the remainder of the inundation. The first rise in 1888 did not come up to within 2′ of that of 1881; but as it seems that 12′ of water on the Bukkur gauge is sufficient to set all canals flowing with a good kharif supply, it may be assumed that any rise above that is, to a certain extent, superabundant, and either goes to extra waterings of kharif crops, or is extensively spread over lands to saturate them, which are afterwards used for rabi crops. It may be understood that the early supply cannot be of much use for soaking lands for rabi crops; but there can be no doubt that much of the supply indicated on the Bukkur gauge above 12′ in a late season goes for that purpose, and the longer the high water lasts the more extensive the rabi area cultivated always is. The season of 1888, besides its extensive increase in the area of kharif cultivation over all other years on record, gives the best return within the last ten years except one (1885) of rabi cultivation, and shows 80,149 acres in excess of 1881. The rainfall in 1881 was more abundant and seasonable than in 1888; therefore the increase in the latter year in either kharif or rabi cannot be credited to rainfall, and the increase of the rabi may be accepted as entirely due to the superabundant supply in the river in the late season, which allowed an extensive area of land to be soaked for that class of cultivation.

3. As the inundations of 1881 and 1888 clearly show that the canals flow with a good supply when the Bukkur gauge reads 12′, that reading on the gauge may be taken as a datum to which the bed clearance of all canals, only carrying a kharif supply, may be reduced. Some of the large canals flow when the Bukkur gauge reading is much lower, say from 5′ to 8′; but then their sectional area with such a depth does not carry the required supply, as no more than 1′ to 3′ depth of water passes down them. All the large main feeders should be deep enough to commence to flow when the river reaches a height of 5′ at Bukkur and when it reaches 12′ the large canals taking from the river should have at least 7′ of water flowing in them. The small channels need not carry more than 4′ to 5′, and observations will now be made with a view of ascertaining the relative bed level of each main canal in connection with a 12′ depth of water on the Bukkur gauge. It is extraordinary how very unequal the sectional areas of the various old canals throughout this province are, some of the large canals having no conformity in depth in comparison to their width, whereas many of the smaller canals have an unnatural depth in comparison to their width. If the depth and area of all canals are regulated to carry a mean supply for the kharif crop, with a 12′ rise at Bukkur, the exact bed clearance in each canal can be regulated to a nicety, and a certain supply be assured every season; and any water above the assured supply could be used for extending kharif operations; or if obtained in the proper season, always profitably used to flood and soak lands for rabi cultivation. There can be no doubt that it is the steady average inundation which can be kept well under control, which gives the best results; and this clearly shows the necessity of keeping the bunds and other controlling works in such complete order so as to be in a position to meet and contend with success any abnormal rises in an inundation which is above the average. As long as the bunds are kept intact and the canals in such order as will tend to their working well with an *average* supply of water, there can never be a failure of crops, or remissions of revenue required for want of water in Sind, but on the contrary a great extension of cultivation may be expected over the protected lands, where, in former days, it was only a mere chance whether crops came to maturity or were destroyed by floods.

4. There are at present no means in this office of showing the relative dates on which the canals flow as compared with the readings on the Bukkur gauge; but from observations in the Hyderabad Canals District the following

may be assumed as nearly correct with regard to the time the several classes of canals could commence to flow :—

1	2	3
The following canals commence to flow with 6′ to 6′ 6″ on the Bukkur Gauge.	The following canals commence to flow with 7′ to 8′ on the Bukkur Gauge.	The following canals commence to flow with 8′ to 9′ on the Bukkur Gauge.
1 Mehrab	1 Bhur, large	1 Laswah.
2 Nasrat	2 Bhortiwah	2 Jeowah.
3 Naolakhi	3 Alibhar Mail ...	3 Gharo Alibhar.
4 Mirwah Sehro ...	4 Sadarang	4 Mirwah Kander.
5 Dadwah	5 Daria Khan	5 Khahwah.
6 Godaro	6 Alibhar Kacheri ...	6 Ghari Fatehpur.
7 Ren	7 Gharo Bhanote ...	7 Lakiarwah.
8 Márak, large	8 Gharo Mahmuda ...	
9 Gharo Rano	9 Ghalu	
	10 Nasirwah	
	11 Sarfrazwah	

Information such as the above will now be collected for all districts in the province, with a view of fixing a common datum to which all the canal bed levels can be compared. It can hardly be disputed that all the canals with large sectional areas and wide beds should have a depth to allow of water entering them when the river is 5′ at Bukkur; but with the exception of about half a dozen, there are none which flow before the Bukkur gauge reads 6′ to 6′ 6″. Even the new Fuleli, Baghar, Ghar and Western Nára bed levels are from 2′ to 3′ above the zero of the Bukkur gauge.

5. There have been no excessive changes in the course of the river to be reported, or no losses by floods. In the Begári district the erosion near Kashmor continued, and began to assume aspects of danger; and in the Ghar districts the Mithu bund fell in through erosion, and necessitated the construction of the inner loop in that bund, which gave way this year and caused considerable trouble in the Lárkhána and Mehar sub-divisions, and on which subject a special report is under preparation. The river also continued its erosions opposite the Phulu and Magsi bunds; and although there was some small damage to the bunds themselves, no damaging floods occurred, as the inundation was a low one. From the Ghar district down, there were no changes of any extent worth noticing; and where the bunds were damaged it was through the river eroding the land from under them, and through no pressure of water against them or failure within themselves.

6. The sum of Rupees nine lákhs, which it is supposed may now be relied upon as the yearly future grant for maintenance and repairs of canals and bunds of the province, is and will be sufficient for some years to come; but as this amount includes provision for both Major and Minor works, it would only be fair that when savings can be effected under one head, that the surplus should go to the other, so that in reality the full sum of Rs. 9 lákhs could be budgetted for in the total sums actually necessary for each class of work. At present the budget grant is made up as under :—

	Rs.
Major works	... 1,24,000
Minor works	... 7,69,000
Total	... 8,93,000

which is Rs. 7,000 less than the Rs. 9 lákhs promised. Experience shows that the grant of Rs. 1,24,000 is sufficient for Major works' repairs, and what is meant by the foregoing remarks is that the sum of Rs. 1,31,000 fixed by Government (*vide* paragraph 18 of Government Resolution No. 56 W.I—783 of 1859) for the class

of works under this head is in excess of actual requirements, and it is therefore desirable that the sum of Rs. 7,000 saved should go towards Minor works, the requirements for which are greater. The budget rules of course do not permit of transfers of allotments from Major to Minor works, and *vice versâ;* but what is required is that the grant for Minor works should be budgetted for at Rs. 7,76,000, or any further increase of savings which can be effected on Major works, and thus come through its proper channel. The saving in the grant for Major works for Sind could be reduced and utilized elsewhere. The sum allowed for extensions and improvements is at present too uncertain; and the sum fixed by my predecessor of Rs. 1,20,000 should be allowed as an unfailing yearly grant for works selected by the officers in the province, and not be sanctioned and allotted in dribblets as it is at present. If this were done, there can be no hesitation in assuring Government that the steady increase in the canal revenue shown for the past ten years can confidently be looked for for the next ten years to come; and that if improvements to existing canals only steadily continue, the sum of Rupees sixty lákhs yearly, within the time named, may, with certainty, be expected. Such a work as the new feeder to the Western Nára cannot be classed under the head of Extensions and Improvements, and must be looked upon as a special work to restore things in Sehwan, Dádú, and other tálukas to the state they were in before the protective bunds were built, and give them back the amount of extra water carried off in the upper part of that canal to the extended cultivation in Mehar and elsewhere, which the protection to the low lands, formerly flooded, now admits of. There are in Sind many hundreds of miles of crudely designed canals on which not one rupee has been expended in actual improvements since the conquest of the country, and which remain, with the exception of the ordinary clearance, in exactly the same state as when taken over. These canals owe Government nothing, but have repaid their maintenance a hundredfold. It is the improvement of such canals by small well considered projects, which might be entirely left in the hands of the provincial officers of the Revenue and Irrigation Departments; and if the sum of Rs. 1,20,000 was allowed yearly, for at least five years certain, as a discretionary grant to be expended as proposed, it would return cent. per cent. on its outlay.

7. With a view to render this report complete as far as possible, and to make it more interesting than heretofore, some of the tables appearing in the body of previous years' reports have been revised, and others have been added to show separately and collectively the assessed revenue under heads "Government" and "Jághir Lands"; and in a similar manner is shown the revenue actually collected under these heads, including miscellaneous receipts. Some other useful tables have also been added, and the Capital and Revenue expenditure incurred on Major and Minor works carried out, or which were in progress during the year, have been described. A fresh table numbered VIIA has been added to the tables accompanying the report in the Appendix, showing the area of kharif and rabi cultivation and the irrigation share of net consolidated assessments for the year of report and the previous year, from which it can be gathered at a glance what the increase or decrease has been on each canal and in each district.

8. With reference to the orders of the Government of India embodied in the preamble to Bombay Government Resolution No. 94A.I.—1209 of 1889, the revenue authorities were called upon to submit statements showing sale of occupancy rights in waste or other lands not belonging to the irrigation capital account works, but directly benefited by their construction, from the year 1881-82 to 1888-89. Such a complete return has only been received from the Deputy Commissioner, Upper Sind Frontier District. The Collector of Shikárpur has furnished the information for one year only. It is not customary to sell lands in the Thar and Párkar District. In the Hyderabad Collectorate, for reasons which the Commissioner in Sind has enquired into, it has been decided that the return which has been received should contain the sales for 1888-89 only. The canals in the Karáchi Collectorate are all works for which only revenue accounts are kept. It will be thus seen that, with the exception of the return for Upper Sind Frontier, the other returns to hand are for 1888-89 only. In order, therefore, to avoid the delay which would ensue from having to wait for the Shikárpur return, a general statement (formulated by the

Examiner, Public Works Accounts) comprising the receipts for the year under review only, has been prepared and is attached as Table VIIB. It would appear from this that the area, the occupancy rights of which were sold, was 27,144 acres; but this is not correct, as the detailed returns submitted by the Revenue officials do not show the area for some of the branches, or even for the main feeders, for instance the Begári, as explained in the remark column of the table. The irrigation share of the receipts is Rs. 54,555; but in the absence of figures for the previous years it is not possible to make any comments. It may be possible to do this next year, as by the time the submission of the next report comes round, the question will be in an advanced stage and the receipts for back years will be carefully enquired into and dealt with in it. Receipts under this head from Works for which only Revenue Accounts are kept must be considerable, judging from the works of extensions and improvements which are annually carried out, and from the increase of cultivation also; and since such receipts from capital works are to be accounted for, there is no reason why receipts from revenue works should not also be dealt with in a similar manner. If this were ordered to be done the record in respect of this source of revenue would be complete, and the results obtained would give an idea as to whether expenditure of money on such class of works would be judicious or not. For instance, the works in the Karáchi Collectorate, all of which are revenue, produced receipts to the extent of Rs. 13,493, of which Rs. 12,144 formed the aggregate irrigation share of the works themselves, the area sold being 7,905 acres.

9. From the following table, the figures in which—the revenue from cultivation—are based on assessment, it can be seen that the agricultural outturn and financial results of the year are most satisfactory, as they have far outstripped those of past years:—

Table A.

Year.	Area of Cultivation.			Irrigation share of net consolidated assessment.
	Kharif.	Rabi.	Total.	
	Acres.	Acres.	Acres.	Rs.
1883-84	1,197,513	1,64,594	1,362,107	31,68,358
1884-85	1,353,960	2,32,319	1,586,279	36,16,370
1885-86	1,288,855	2,43,867	1,532,722	34,33,190
1886-87	1,407,778	1,85,888	1,593,666	35,89,499
1887-88	1,433,216	2,15,411	1,653,627	37,20,291
Average ...	1,337,264	2,08,416	1,545,680	35,05,542
1888-89	1,648,586	2,38,970	1,887,556	42,25,697
Increase or Decrease ...	+311,322	+30,554	+341,876	+7,20,155

Compared with the average of five previous years the increases under kharif and rabi are 311,322 and 30,554 acres respectively, and the increase under irrigation share of net consolidated assessments Rs. 7,20,155. Compared with the past year only, which up to that date was the best on record, the increases under these heads have been 210,370 and 23,559 or a total of 233,929 acres, and Rs. 5,05,406 respectively, which shows that the agricultural year was one of very considerable prosperity.

10. The following table, which has been revised, and the revenue figures as in Table A based on assessments, shows the area of cultivation under kharif and rabi separately, and the irrigation share of net consolidated assessments, for the year under review and the past year, for the area under both classes of crops; and the increase or decrease under each may be seen at a glance for each district separately, and for the whole province collectively:—

Table B.

Canals and District.	1887-88.			1888-89.			Results.		
	Cultivation.		Irrigation share of net consolidated assessment.	Cultivation.		Irrigation share of net consolidated assessment.	Cultivation.		Irrigation share of net consolidated assessment.
	Kharif.	Rabi.		Kharif.	Rabi.		Kharif.	Rabi.	
	Acres.	Acres.	Rs.	Acres.	Acres.	Rs.	Acres.	Acres.	Rs.
Begári Canals	196,187	13,423	3,30,624	249,727	29,509	5,20,162	+53,560	+16,086	+1,39,538
Shikárpur Canals	97,460	28,046	3,22,473	110,952	26,181	3,55,136	+13,492	—1,905	+32,663
Ghár Canals	316,698	54,314	10,31,119	365,498	63,054	12,10,725	+48,802	+8,740	+1,79,606
Eastern Nára Canals	123,197	39,948	3,15,802	163,526	50,174	3,89,214	+35,329	+10,226	+73,412
Hyderabad Canals	288,523	19,191	6,13,847	317,405	16,965	6,64,710	+28,882	—2,216	+50,863
Fuleli Canals	210,294	26,766	5,29,157	225,820	26,674	5,46,719	+15,526	—92	+17,562
Karáchi Canals	200,879	33,693	5,27,269	215,658	26,413	5,39,031	+14,779	—7,280	+11,762
Total ...	1,438,216	215,411	37,20,291	1,648,586	238,970	42,25,697	+210,370	+23,559	+5,05,406

It will be seen from the above that the increase under kharif has been general in all districts; and that although in four of them the rabi area has diminished, the increase in the kharif area in all districts and of the rabi in some made up for it in the aggregate, and leaves a large balance to the good, and thereby increased the irrigation share of net consolidated assessment to a considerable extent in each case. The net total area under kharif and rabi is, in the case of every district, an increase over that of the previous year, and with a view to it being readily traceable the increases are separately noted below :—

	Acres.
Begári Canal district	69,646
Shikárpur Canals district	11,587
Ghár Canals district	57,542
Eastern Nára districts	45,555
Hyderabad Canals district	26,666
Fuleli Canals district	15,434
Karáchi Canals district	7,499
	233,929

These increases have been contributed by all the works of the province, with the exception of the Sukkur-Begári bund in Shikárpur Canals district; Wahur in the Ghár Canals district; the Renwah and some small canals in the Hyderabad Canals district; the Phitta, Uchita, Canals in Jati, the Kokawari, and the canals in Shahbandar of the Karáchi Canals district. The increase may be said to be due almost entirely to new areas having been taken up and brought under cultivation. A fresh table VIIA, alluded to in paragraph 5, compiled for the first time, is submitted in the Appendix: it is useful for purposes of comparison, as in it are shown, as already remarked, the agricultural operations under kharif and rabi, and the financial results of the year under report and for the past year, together with the results obtained under all these heads; and it will therefore help considerably in forming an idea as to the duty performed by each of the canals of the province separately.

11. In the following table are exhibited for each district separately the irrigation share *only* of the net consolidated assessments for the year under report and for five previous years, and not as heretofore the Hakaba from Jághirs and Miscellaneous Canal Revenue (both actual receipts), the inclusion of which in this table Government have, in their Resolution No. 56 W. I.—783, dated 29th April 1889, reviewing the revenue report of 1887-88, remarked to be an inconvenient combination :—

Table C.

Years.	Begári Canals.	Shikárpur Canals.	Ghár Canals.	Eastern Nára Canals.	Hyderabad Canals.	Fuleli Canals.	Karáchi Canals.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	2,95,175	2,09,065	11,09,136	1,63,660	5,30,898	3,99,989	4,60,435	31,68,358
1884-85	3,76,829	2,64,978	12,61,668	2,03,157	6,04,356	3,72,799	5,32,583	36,16,370
1885-86	4,10,224	2,81,037	10,14,958	2,17,190	5,93,303	3,92,485	5,23,993	34,33,190
1886-87	3,69,932	3,08,363	10,39,583	2,56,550	6,00,052	4,74,182	5,40,837	35,89,499
1887-88	3,30,624	3,22,473	10,31,119	3,15,802	6,13,847	5,29,157	5,27,269	37,20,291
Average	3,66,557	2,77,183	10,91,293	2,31,272	5,88,491	4,33,723	5,17,023	35,05,542
1888-89	5,20,162	3,55,136	12,10,725	3,89,214	6,64,710	5,46,719	5,39,031	42,25,697
Increase or Decrease	+1,53,605	+77,953	+1,19,432	+1,57,942	+76,219	+1,12,996	+22,008	+7,20,155

The figures in the above table are details of those given in the last column of Table A, which being shown in an abstract form gives but an indistinct idea of the income of the canals, whereas in the above the earnings of each district are given separately for the year under review and for five previous years, and is a useful record for future reference. The assessment of the year, compared with the past year and with the average of five previous years, is in the case of every district the best on record as already pointed out. The total increase, as contrasted with the past year, is Rs. 5,05,406 and the sums contributed by each district towards this increase can be gathered from Table B; and if the increase of Rs. 19,160 in the Jághir assessment of the year, which will be dealt with in the next paragraph, be added, the total increase is Rs. 5,24,565. In examining the figures for the series of years recorded above, it is seen that the development of revenue has been steady; and as it must be admitted that, with facilities for watering their lands, the present population are able and willing to spread cultivation, there is little doubt but that the area of cultivation and canal revenue will go on increasing year by year. It may be well to again point out the advantages accruing from such works as the Desert Canal, Unharwah and the Begári Canal, and the Eastern Nára Works, which have paid in the year under review 12·14, 15·8, 14·11 and 5·30 per cent. respectively on the capital outlay to the end of that year. It is therefore very desirable that projects for such works and the funds required for their execution, as well as for ordinary extensions and improvements of old canals, should be readily entertained and provided, and it may not be out of place to mention below the projects which are now before Government, or have already been sanctioned by them, and which are in course of construction or have been completed in the early part of the current year:—

1 Jacob Canal.
2 Western Nára, new feeder to the.
3 Dimwah, extensions and improvements to.
4 Khipra Canal.
5 Renwah improvements.

12. The Jacob Canal has for its object the direct supply of water to the balance of uncultivated lands in British territory around Jacobabad, while at the same time giving a direct supply to lands lying waste in Kelat territory which at present, it must be remembered, are cut off from their direct source of supply, the Indus, by intervening British territory. The Kelat lands are now dependent for their supply from the Desert Canal, the Begári proper and its branches the Nur and Sir canals, and have no possible chance of a further supply of water except through the proposed new canal, as, owing to the large increase of cultivation in British and Kelat territories, the supply in the above-named canals has become quite insufficient to meet the demand on them, and the portion of territory through which they pass is therefore inadequately watered. Consequently an outcry for a better supply has arisen and rendered the project submitted urgently necessary. By carrying out this scheme the water from the Begári, Nur and Sir canals can be retained within British territory, which, together with the water derived from the new canal, will bring an enormous area under cultivation, leaving at the same time a sufficient supply for the irrigation of a lákh of acres in Kelat territory.

13. The new feeder to the Western Nára has for its object the bringing under cultivation a new area of 10,767 acres, and securing a lost area of 16,877 acres, which have been thrown out of cultivation for want of water, owing to increased consumption in the higher reaches of the canal in the Shikárpur Collectorate. The necessity for this work has been noticed in paragraph 77 of the Irrigation Revenue Report for 1887-88, and therefore needs no lengthy remarks.

14. The extensions and improvements to the Dimwah in the Eastern Nára district, which have already been sanctioned and were in course of construction on 31st March last, will bring under cultivation a large area of waste land not watered by any other canal, and will command 48,000 acres both in the Thar and Párkar and Hyderabad districts, one-third of which will be annually cultivated.

15. The extensions and improvements to the Khipra Canal (also in the Eastern Nára districts), which have already been sanctioned and now in progress, will command 40,000 acres, one-third of which will be annually irrigated. Independently of this project, an embankment south of Khipra from Bhaiti-ki-bhit to opposite the head of Thar Canal, on the right bank of the river Nára, has also been sanctioned and is now in course of construction. The object of this work is to prevent overflow which annually takes place on to the lands, rendering the ground unfit for cultivation, and when it is completed, 16,000 acres will be protected for cultivation, and one-third of this area will be annually irrigated.

16. The Renwah improvement has for its object the watering of 14,592 acres in excess of the present area cultivated, and also insuring the full supply to the present settled lands. The canal is one of the old ones taken over with the country, and on which no money for improvements has heretofore been expended.

17. When the projects now before Government are sanctioned and those in course of construction completed, and the whole are in operation, and taking also into account the increase anticipated in the area commanded by the canals as now existing, it is not improbable that the irrigated area of the province will reach a total of 30 lákhs of acres, giving a return of revenue of 75 lákhs of rupees, calculated at the average rate of Rs. 2-8-0 per acre. The present population is quite large enough to cultivate 30 lákhs of acres yearly; and as there is much more than double that quantity of good land lying waste, the only thing to impede the increase anticipated as above is an inadequate water-supply. In 1879-80, when the canal revenue of the province was only Rs. 28,53,207, it was never contemplated that in 1888 it would reach Rs. 44,69,436, or an increase of Rs. 16,16,229; and there can be no reason to fear the least check in this advancing prosperity if only irrigational facilities are steadily increased.

18. The following table shows the area of cultivation and assessment and balances due on account of Jághir lands for the year under review and for the previous year :—

Table D.

District.	Area cultivated during year.	Unrealized balance at end of year.	Assessment of the year.		Total.	Remission during year.	Net total realizable.	Actual realization during year.	Balance outstanding at end of year.
			Area.	Amount.					
	Acres.	Rs.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Kelat	76,296	67,507	76,296	76,395	1,43,902	..	1,43,902	1,17,173	26,729
Upper Sind Frontier ..	1,135	373	1,135	523	896	..	896	672	224
Shikárpur	29,669	4,744	29,669	11,695	16,439	..	16,439	13,507	2,932
Thar and Párkar.. ..	2,445	65	2,445	1,173	1,238	..	1,238	116	1,122
Hyderabad	103,348	20,873	103,348	40,405	61,278	..	61,278	56,280	4,998
Karáchi	18,186	1,260	18,186	7,264	8,524	..	8,524	6,142	2,382
1888-89	231,079	94,822	231,079	1,37,455	2,32,277	..	2,32,277	*1,93,890	38,387
1887-88	217,487	90,288	217,487	1,18,295	2,08,583	1,450	2,07,133	1,12,320	94,813
Increase or Decrease ..	+13,592	+4,534	+13,592	+19,160	+23,694	1,450	+25,144	+81,570	—56,426

	Rs.	Rs.
		*1,93,890
Amount realized by Public Works Officers ..	244	
Due to difference of annas and pies	1	
		245
As in Table III ..		1,94,135

It will be seen from the above table that both the area of cultivation and assessment of the year are above those of the previous year by 13,592 acres and Rs. 19,160 respectively; and these increases have been contributed by the following districts, as compared with the past year :—

District.	1887-88.		1888-89.		Results.	
	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
Kelat	63,853	64,083	76,296	76,395	+12,443	+12,312
Upper Sind Frontier	842	413	1,135	523	+293	+110
Shikárpur	29,423	12,334	29,669	11,695	+246	—639
Thar and Párkar	1,314	628	2,445	1,173	+1,131	+545
Hyderabad	104,029	33,744	103,348	40,405	—681	+6,661
Karáchi	18,026	7,093	18,186	7,264	+160	+171
Total ...	217,487	1,18,295	231,079	1,37,455	+13,592	+19,160

19. The largest increase was in Kelat, and may be explained as follows. During the year under review the kharíf cultivation was 5,143 acres in excess of that of the previous year. This increase is partly due to the favourable inundation, and partly to the fact that certain zamíndárs resumed cultivation on the Desert Canal on lands which have lain fallow ever since 1884-85. The rabi area of the year also shows an increase of 7,300 acres over that of the previous year, and this, like the increase under kharíf, is attributable to the favourable inundation at the close of the season, which helped the zamíndárs to soak their lands for rabi. It may be mentioned, speaking of minor branch canals, that there was a decrease in the kharíf crops on the Nurwah and Sirwah, due to the fact that the Edenwah carries off a large supply of water which was formerly supplied to Kelat lands; and also to the fact that certain low-lying lands in Tapa Alipur, of the Jacobabad Táluka, consumed a large volume of water from the Nurwah; in consequence of which the amount of water available for cultivation in Kelat territory, which only obtains a supply after the wants in the Jacobabad District have been met, has been curtailed. To meet some of the calls on the Begári and its branches, and on lands in the Shikárpur Collectorate, the canal must be widened for the first 17½ miles of its course, and a new branch, besides, taken out of the third or fourth mile into the Shikárpur Collectorate. These necessary improvements are now being examined into and surveyed for by the Executive Engineer, Begári Canals; and it is anticipated that very large returns will be shown on the estimated cost of what is proposed. The facts detailed above prove beyond doubt the great necessity which exists for the construction, with the least possible delay, of the Jacob canal; which, besides producing a good return on the capital to be invested, will vastly improve the present state of affairs and bring a considerable area of new land under cultivation, which at present is lying waste for want of water. The increase in the area of cultivation in the other districts, although small, is satisfactory. The results shown against Shikárpur and Hyderabad are very arbitrary indeed, as it is not at all clear how, in the case of the former, with an increased area of 246 acres of cultivation, there could be a decrease in assessment of Rs. 639; and in the case of the latter, with a decrease in the area of cultivation of 681 acres, there could possibly be an increase in assessment of, if so much, as Rs. 6,661. These differences have not been explained by the Revenue officials and are therefore unaccountable.

20. The outstanding balances of Hakaba at the end of the year, and for the province as a whole, show considerable improvement over that of the previous year, in which it was Rs. 94,813. Although Kelat shows the largest amount of outstandings the collections for the year exceed those of the previous year by Rs. 58,248, which is very satisfactory; and it is still more satisfactory to record that of the outstanding balance of Rs. 26,729 shown in the above table Rs. 10,125 has been collected and paid into the British Treasury soon after the last financial year had closed, and that the recovery of a further sum of Rs. 7,450 has been definitely arranged for by the Political Agent, Captain Temple, who is in charge of the Kelat lands, before the expiry of the current year. The balance which was left would be Rs. 9,154, and is, it appears, due on account of rabi crops, and was not due until after the 31st March last. The balances outstanding against the other districts are all below those of the past year, with the exception of the Thar and Párkar and Karáchi districts, and may be considered as satisfactory on the whole.

21. It may be further noticed that since the unsatisfactory state of the canal revenue produced from water supplied to lands in Kelat territory was brought forward prominently in the report for 1886-87, there has been a very decided improvement in the revenue collections.

The following table (obtained from the Political Agent, Kelat) of results for the past five years, and for the year under review, of revenue and its collection in Kelat territory shows at once the improvements under these heads which have taken place:—

Years.	Area cultivated in acres.	Unrealized balance at end of last year.	Assessment.	Total realizable.	Actual realized.	Balance.	Remission.
	A. g.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
1883-84	78,828 37	70,458 4 0	69,402 1 0	1,37,866 4 0	42,691 15 0	95,174 5 0	2,084 1 0
1884-85	91,572 6	95,174 5 0	70,453 8 0	1,65,627 13 0	60,548 15 0	1,05,078 14 0	.....
1885-86	61,022 9	1,05,078 14 0	60,154 15 0	1,48,168 14 0	48,000 0 0	1,00,168 14 0	17,064 15 0
1886-87	67,225 10	1,00,168 14 0	67,024 8 0	1,42,251 2 0	78,477 5 0	63,773 13 0	24,942 4 0
1887-88	63,853 20	63,773 13 0	64,083 7 4	1,26,432 7 4	58,924 12 9	67,507 11 2	1,424 13 0
1888-89	68,000 0	67,507 11 2	68,000 0 0	1,35,507 11 2	1,27,663 14 9	7,844 12 5	.....

Much of the improvement is due to the personal interest taken by Captain Temple, who is in charge of these lands since then, as he has instituted a regular check on measurements of crops and an inspection of those recommended by his subordinates for remissions. There were no remissions allowed for the year under report, and arrangements are now such that for the future none but what are really necessitated through loss of crops from a scanty supply of water will be entertained. The better supervision now taking place is no doubt satisfactory; but until the lands are surveyed and properly demarcated, no official, no matter how willing he may be to get the best results, can supervise and ascertain accurately the extent of crops growing on an open and undefined plain.

22. In the last column but one of Table VI are recorded for each canal separately the differences between assessments of water rates on Jághír lands and the assessments at the ordinary rates in force for Government land; and in the following table are shown for each class of work separately the depreciation of canal revenue caused by such differences:—

Table D (1).

Class of works.	Hakaba at present assessment.	Loss.	Jághir revenue, what it ought to be.	Water share of Government land assessment.	Total, what it should be for the province.
	Rs.	Rs.	Rs.	Rs.	Rs.
Major Works	81,060	84,909	1,65,969	9,02,811	10,68,780
Minor Works, Capital ...	31,018	1,73,222	2,04,240	14,44,995	16,49,235
Do. Revenue ...	25,377	1,51,287	1,76,664	18,77,891	20,54,555
Total ...	1,37,455	4,09,418	5,46,873	42,25,697	47,72,570

It will be seen that the difference on this account is no less than Rs. 4,09,418, and but for this the assessment of the year would have been Rs. 5,46,873; and taking into account the water share of net consolidated assessments on Government land, the entire income of the canals of the province would have been Rs. 47,72,570 instead of Rs. 43,63,152. The difference is large, but the Commissioner in Sind, in transmitting the Irrigation Revenue Report for the past year, remarked in reference to the subject that in some instances additional contributions in the shape of enhanced Hakaba was possible, and should this be arranged for, it will compensate, although to a small extent, the loss (if such it can be termed) now incurred. The Hakaba rates have been changed from time to time. For a considerable time the rate was 3 annas a bigha, but under the orders of the Government of Bombay in the Public Works Department, issued under Government Resolution No. 142 A. I.—624, dated 22nd November 1884, the rates were enhanced as follows:—

	Maximum per acre.	Minimum per acre.
Rice lands ...	10 annas.	7 annas.
Other lands ...	8 „	5 „

23. It rests with Government to say whether it would be politic or not to increase these rates. It was hardly possible to know or contemplate, when the original Jághírs were established, that the Jághírdárs would have increased their cultivation and revenue, and increased their demands for canal water to the extent they have; and it would scarcely be unjust if they were called upon to pay a very largely enhanced Hakaba on all the increased area they have cultivated since their first settlement; or some period back might be named, when the acreage could be fixed as having reached the maximum allowed for at the above rates, and when the maximum was fixed, a rate of Rs. 1-8-0 all around, on all cultivation above it, would not be at all exorbitant.

24. There is another source of canal revenue in Sind which seems to require some fixed rules for its assessment; that is, the charges made and realized for water to lands on which tree plantations (Huris) are allowed. In the Thar and Párkar District a charge of 12 annas an acre is levied for water when used for Bábul plantation or growing other trees. There is no charge made in any

other part of the province under this head, as it is supposed that only waste water is used for the purposes. It is a very great mistake to suppose that any of the water entering any of the Sind canals can be classed as waste; and in many instances the water carried off for (Huris) plantations could be utilized on other lands, if not on the lands themselves on which the trees are grown, to produce very remunerative crops of another sort. In the Upper Sind Frontier District it has just been ruled that the Forest Department is to pay for water used in irrigating the Macaulay and Dickinson forests from the Nurwah, although the water will be generally supplied from what the Forest Officers consider as waste. There seems no reason why private forests or plantations should not also pay some amount of water rate: particularly as it is well known that they are a profitable source of income to their owners. At present a dispute has arisen in the Thar and Párkar District, on the Dimwah, where a zamíndár holds a Bábul plantation (Huri) of 66 acres, which formerly got water from a branch of the great Márak. In former years there was no such Huri in existence, but on the improvement of the Márak it sprang up. It is now brought under the Dimwah supply, and its owner claims water for it free, although the water for a rice crop for the extent of land above named would be worth Rs. 214.

25. The following table represents assessments on Government and Jághír lands irrigated during the year of report, and for the past five years :—

Table D (2).

Years.	Assessment.		
	Government land.	Jághír land.	Total.
	Rs.	Rs.	Rs.
1883-84	31,68,358	1,13,119	32,81,477
1884-85	36,16,370	1,16,637	37,33,007
1885-86	34,33,190	1,13,802	35,46,992
1886-87	35,89,499	1,23,598	37,13,097
1887-88	37,20,291	1,18,295	38,38,586
Average ...	35,05,542	1,17,090	36,22,632
1888-89	42,25,697	1,37,455	43,63,152
Results ...	+7,20,155	+ 20,365	+ 7,40,520

It is evident from the above figures that the result of the year under both classes compared with the average is satisfactory, the result of the year compared with the previous year being an increase of Rs. 5,05,406 for Government land and Rs. 19,160 for Jághír land. The above table was not furnished in former reports, and is given in this with a view to show the assessments under both heads and to serve as a record for reference in future years. The figures of assessment on account of Jághír lands have reference to those shown in Table D in the case of two years only, namely 1887-88 and 1888-89; so the above table, which is for a series of five years, exclusive of the year under review, is useful.

26. The following table, which has been modified in accordance with the instructions issued in paragraph 12 of Government Resolution No. 56 W. I.—783 of 1889, shows the total for collection and what was actually realized during the year:—

Table E.

Districts.	Unrealized balance at end of year.	Deduct remissions on account of former years.	Net amount realizable on account of outstanding at beginning of year.	Net consolidated assessment during year as per Canal Return VIII.	Total for collection during year.	Actual receipts during year.	Balance outstanding at end of year.	Irrigation share of collection.
1	2	3	4	5	6	7	8	9
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Upper Sind Frontier ...	11,071	3,431	7,640	5,80,770	5,88,410	5,71,246	17,164	5,14,122
Shikárpur	6,134	773	5,361	17,39,602	17,44,963	17,38,899	6,064	15,65,010
Thar and Párkar	253	...	253	4,12,341	4,12,594	4,12,317	277	3,71,086
Hyderabad	4,987	312	4,675	13,57,613	13,62,288	13,61,484	804	12,25,336
Karáchi	20,152	2,646	17,506	6,04,890	6,22,396	5,99,622	22,774	5,39,660
	42,597	7,162	35,435	46,95,216	47,30,651	46,83,568	47,083	42,15,214

It will be seen from the above that the total for collection, the actual realizations, and irrigation share of collection for each district, are considerably in excess of the previous year as explained in the following table :—

	Total for collection.	Actual realizations.	Irrigation share of collection.
	Rs.	Rs.	Rs.
Upper Sind Frontier	1,34,455	1,28,362	1,15,526
Shikárpur	2,33,968	2,34,038	2,10,631
Thar and Párkar	75,009	74,985	67,487
Hyderabad	69,772	73,955	66,560
Karáchi	12,264	9,642	8,677
Total increase ...	5,25,468	5,20,982	4,68,881

It must be understood that the above results are actual increases over those of the past year, and therefore very satisfactory; all the more so because the increases are traceable in every district. Considering that the total for collection for the previous year was Rs. 42,05,183, and for the year under review Rs. 47,30,651 or Rs. 5,25,468 more, it is satisfactory to note that the balance for the province outstanding at the end of the year was only Rs. 47,083, or only Rs. 4,658 more than in the previous year; which, judging from the results of former years, when, with much smaller amounts for collection the outstandings were considerable, it may be presumed, clearly indicates that the zamíndárs are advancing in prosperity, and therefore are able to pay their assessment with greater ease than heretofore. Only in the case of the Upper Sind Frontier and Karáchi Districts the balances outstanding (Rs. 6,093 and Rs. 2,622) are remarkable, but they are due more or less to the collections for the year having been greater than that of the past year. The figures in the above table have been verified by the Examiner, Public Works Accounts.

27. In the following table are shown the actual realizations on account of Hakaba on the Jághír area irrigated during the year of report, and for the past five years :—

Table E (1).

Years.	Begárí Canals.	Shikárpur Canals.	Ghár Canals.	Eastern Nára Canals.	Hyderabad Canals.	Fuleli Canals.	Karáchi Canals.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	44,823	1,503	3,739	361	14,162	15,843	4,703	85,134
1884-85	62,445	882	6,343	699	13,827	17,570	4,324	1,06,090
1885-86	52,205	6,391	6,565	361	9,919	16,069	4,527	96,037
1886-87	82,104	4,134	5,616	1,196	20,311	21,983	4,685	1,40,029
1887-88	61,778	2,966	4,201	819	14,479	19,252	9,008	1,12,503
Average	60,671	3,175	5,293	687	14,540	18,143	5,449	1,07,958
1888-89	1,20,622	3,616	6,489	986	24,929	31,351	6,142	1,94,135
Increase or Decrease ...	+59,951	+441	+1,196	+299	+10,389	+13,208	+693	+86,177

As compared with the average of five previous years the result is an increase in the case of every district, or a total increase of Rs. 86,177 for the province, and is therefore satisfactory. Compared, on the other hand, with the realizations of the past year, there has been an increase also in every district but one, namely, the Karáchi Canals, which shows a falling off of Rs. 2,866. The net increase for the province, however, is Rs. 81,632. The decrease in the Karáchi District is due apparently to the amount realized being lower than in the previous year, in which, out of a net assessment of Rs. 10,262, a sum of Rs. 9,008 was collected, leaving an outstanding balance of Rs. 1,251; whereas in the year under review, out of a net assessment of Rs. 8,523, only Rs. 6,142 were realized, leaving a larger comparative balance (Rs. 2,381) than in the previous year.

28. The following table shows the miscellaneous canal revenue, which is based on actual realizations for each district separately and for the year under review and five previous years :—

Table E (2).

Year.	Begári Canals.	Shikárpur Canals.	Ghar Canals.	Eastern Nára Canals.	Hyderabad Canals.	Fuleli Canals.	Karáchi Canals.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	1,955	1,702	11,078	21,575	3,000	5,492	8,758	53,560
1884-85	924	4,220	11,618	17,347	2,086	4,546	9,965	50,706
1885-86	859	1,601	11,202	18,362	3,058	3,692	9,340	48,114
1886-87	883	1,960	9,291	16,526	3,879	6,131	9,787	48,457
1887-88	947	2,073	9,191	15,173	3,307	4,883	9,716	45,290
Average	1,113	2,311	10,476	17,797	3,066	4,949	9,513	49,225
1888-89	957	2,164	10,001	15,824	3,987	4,809	11,862	49,604
Increase or Decrease ...	—156	—147	—475	—1,973	+921	—140	+2,349	+379

It will be seen from the figures given above that the results of the year, compared with the past year, show an increase in the case of every district save one, namely the Fuleli district, the net increase being Rs. 4,314. Compared with the average of five previous years the receipts have fallen in all but the Hyderabad and Karáchi Canals districts; and to the better results on these districts is due the net increase, for the province, of Rs. 379. The items which constitute receipts under this head are Plantations and other canal produce such as fisheries, bábul pods, lak, grass and reeds, and several other minor items forming part and parcel of the canals within their boundaries. Any increased annual income over the present miscellaneous receipts is only problematical and cannot be looked upon with any degree of certainty. The income of the Eastern Nára districts under the head "Miscellaneous" is the greatest, and is due to the facts that in that district a tax is levied on *ghee* and that the quantity of fish is considerable in the river Nára and also in the Makhi and other dhands. Next in order are the Ghár and Karáchi Canals districts, but there is no information to show with certainty to what causes the largeness of the receipts are due. They are probably due also to increased receipts from fisheries, as there are in them several large dhands and dhoras. Miscellaneous canal revenue is shown in canal return IX (columns 14, 15 and 16) and it would be well if the revenue authorities attached to it a note comparing the results of each item for the year under review with those of the previous year. Such a procedure would aid considerably in explaining the causes of increased or decreased miscellaneous receipts. At present only the return of the Thar and Párkar District furnishes this information, and it would be well if the other districts furnish it also in future.

29. In the tables given in paragraphs 26, 27 and 28 the actual realizations on account of (1) Government land, (2) Jághir land, and (3) Miscellaneous receipts are shown separately, and it therefore appears desirable to bring them together and exhibit them in one table as below.

Table E (3).

Years.	Government.	Jághir.	Miscellaneous.	Total actual receipts.
	Irrigation share of net consolidated assessment collected.	Hakaba.		
	Rs.	Rs.	Rs.	Rs.
1883-84	31,12,494	85,134	53,560	32,51,188
1884-85	36,93,821	1,06,090	50,706	38,50,617
1885-86	34,87,863	96,037	48,114	36,32,014
1886-87	36,09,629	1,40,028	48,458	37,98,115
1887-88	37,46,333	1,12,503	45,290	39,04,126
Average ...	35,30,028	1,07,958	49,226	36,87,212
1888-89	42,15,214	1,94,135	49,604	44,58,953
Increase or Decrease ...	+6,85,186	+86,177	+378	+7,71,741

Here, as in the case of assessments, the results are the best on record, the total increase under all heads, compared with the previous year, being Rs. 5,54,827 and with the average of previous years Rs. 7,71,741. The reasons for these good results having been explained in their proper places, it is unnecessary to comment on them here.

30. In the following table are recorded the remissions for the year under review and for six previous ones:—

Table F.

District.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	Average.	1888-89.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	...	4,685	3,376	10,708	20,335	13,032	8,689	16,116
Shikárpur do.	842	6,814	369	123	668	101	1,486	174
Ghár do.	66,818	17,312	27,585	1,12,111	92,277	21,387	56,249	9,535
Eastern Nára...	13,476	910	267	4,413	43	177	3,214	874
Hyderabad Canals	18,817	493	60,391	2,757	3,418	3,031	14,818	3,809
Fuleli do.	5,248	1,036	3,246	1,413	707	3,203	2,475	976
Karáchi do.	1,06,505	61,621	16,814	24,891	18,971	21,006	41,635	31,561
Total ...	2,11,706	92,871	1,12,048	1,56,416	1,36,419	61,937	1,28,566	63,045

The remissions for all the districts, with the exception of the Begári, are considerably below the average of six previous years, and for the province they are less by Rs. 65,521, which is satisfactory. Compared with the previous year the increases are in the Begári (Rs. 3,084), Shikárpur (Rs. 73), Eastern Nára (Rs. 697), Hyderabad (Rs. 778) and Karáchi (Rs. 10,555), the net increase for the province being only Rs. 1,108. The causes which rendered the grant of these remissions necessary are unexplained, as the Executive Engineers generally state there was no deficiency of water in the canals. In some cases it is stated that the zamindárs did not clear their water-courses properly; but if they have drawn off a supply in their imperfect channels from the canals, only to bring their crops to a certain amount of maturity, that does not seem a reason for granting full remissions. This loss of revenue on lands which have been watered, although only partial, indicates waste, which deprives others, who could have extended their cultivation, of what was their right. The remission of revenue over an extensive area clearly shows that a large number of agriculturists have wasted their time, and could have increased the returns of the canal revenue, if irrigational facilities, let them be private or public, were steadily improved. Some reasons should be shown for the future by the Revenue officers to this office for granting remissions on the score of imperfect water-supply; for then, in case of a defect in a canal, it can be remedied or extra funds asked for for its improvement.

31. The following table shows the expenditure incurred during the year and six previous years on maintenance and repairs and establishment, of all canals and bunds in the province, including collection charges:—

Table G.

Years.	Maintenance and Repairs.			Revenue Collection Charges.	Total.
	Works.	Establishment.	Total.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1882-83	8,68,991	2,22,036	10,91,027	2,72,652	13,63,679
1883-84	8,78,816	2,14,128	10,92,944	2,74,762	13,67,706
1884-85	8,53,757	2,13,717	10,67,474	3,36,613	14,04,087
1885-86	8,31,148	2,48,524	10,79,672	3,16,215	13,95,887
1886-87	8,27,922	2,71,930	10,99,852	3,29,394	14,29,246
1887-88	10,41,501	2,61,116	13,02,617	3,42,170	16,44,787
Average ...	8,83,689	2,38,575	11,22,264	3,11,968	14,34,232
1888-89	9,20,449	2,61,271	11,81,720	3,91,630	15,73,350
Difference ...	+36,760	+22,696	+59,456	+79,662	+1,39,118

The expenditure of the year under head "Works" is Rs. 1,21,052 less than in the previous year; and judging from the increased results obtained, it appears to have been sufficient for the season. The total expenditure of the year was incurred on the following items of works which now constitute the heads of estimates under which the canal clearance grant is laid out:—

1. Silt clearance.
2. Repairs to canal embankments.
3. Special clearance and improvements to canal heads.
4. Side sloping (to a limited extent).
5. Removing curves (where more profitable than clearing long bends).
6. Repairs to river embankments.
7. Repairs to pathways.
8. Jungle cutting.
9. Repairs to canal Chaukis.
10. Repairs to regulators and sluices.
11. Erecting bunds at mouths of canals (to carry out clearance).
12. Pegging, estimating, levelling and uncovering bed stones.
13. Maintaining canal gardens (small item).
14. Fixing bed and indicator stones.
15. Pay of Mukádams.
16. Stone pitching (small item).
17. Felling trees on canal berms.
18. Compensation for land.
19. Removing spoil where too close to canal.
20. Removing toodas in bed of canal.
21. Jucking or protecting banks by mats.
22. Establishment chargeable to Works.

The details of expenditure incurred under these heads are given in the Annual Administration Report of the department for 1888-89 already published, and therefore need not be repeated here.

32. The following table shows the division of expenditure between canals and bunds for the same series of years as above:—

Table G (1).

Maintenance and Repairs of Canals and Bunds.

Years.	Canals.					Bunds.				
	Works.	Establishment.	Total.	Revenue Collection.	Total.	Works.	Establishment.	Total.	Revenue Collection.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1882-83	7,17,883	1,87,930	9,05,813	2,71,515	11,77,328	1,51,108	34,106	1,85,214	1,137	1,86,351
1883-84	6,99,084	1,75,403	8,74,487	2,73,698	11,48,175	1,79,732	38,725	2,18,457	1,074	2,19,531
1884-85	7,40,540	1,93,796	9,34,336	3,34,972	12,69,308	1,13,217	19,921	1,33,138	1,641	1,34,779
1885-86	7,11,982	2,19,200	9,31,182	3,14,002	12,45,184	1,19,166	29,324	1,48,490	2,213	1,50,703
1886-87	6,62,498	2,23,334	8,85,832	3,28,154	12,13,986	1,65,424	48,596	2,14,020	1,240	2,15,260
1887-88	8,58,758	2,21,266	10,80,024	3,41,424	14,21,448	1,82,743	39,850	2,22,593	746	2,23,339
Average ...	7,31,791	2,03,488	9,35,279	3,10,626	12,45,905	1,51,898	35,087	1,86,985	1,342	1,88,327
1888-89	8,03,156	2,20,902	10,24,058	3,90,914	14,14,972	1,17,293	40,369	1,57,662	716	1,58,378
Difference ...	+71,365	+17,414	+88,779	+80,288	+1,69,067	—34,605	+5,282	—29,323	—626	—29,949

The expenditure of the year on account of Works and Establishment under head "Canals," although more than the average of six previous years, is less than in the previous year by Rs. 55,602 and Rs. 364 respectively, and this is satisfactory. The expenditure shown against Works under head "Bunds" is less in the case of both periods; but in the case of establishment, the expenditure of the year is more than that of the previous year, and the average of six previous years, by Rs. 519 and Rs. 5,282 respectively.

33. The following table shows the expenditure on extensions and improvements for the year of report and six previous years:—

Table G (2).

Years.	Extensions and Improvements.		
	Works.	Establishment.	Total.
	Rs.	Rs.	Rs.
1882-83	1,20,143	20,342	1,40,485
1883-84	1,40,694	29,107	1,69,801
1884-85	1,51,847	31,040	1,82,887
1885-86	1,28,984	34,257	1,63,241
1886-87	2,00,615	49,647	2,50,262
1887-88	1,67,420	36,676	2,04,096
Average ...	1,51,617	33,511	1,85,128
1888-89	1,32,558	36,451	1,69,009
Difference ...	—19,059	+2,940	—16,119

With two exceptions in the series given, the expenditure of the year is less than that of former years; and compared with the past, and the average of six previous years, the outlay is less by Rs. 34,862 and Rs. 19,059 respectively, which is to be regretted in the case of works, as any tendency to restrict expenditure under this head will surely impede the advance of cultivation and revenue. The total charge also under both heads shows a decrease of Rs. 35,087 and Rs. 16,119, compared with the past year and the average; and is therefore favourable in the case of establishment.

34. The several items of works constituting the expenditure of Rs. 1,32,558 for the year of report are given in Table IV; but for a greater degree of detail, and in accordance with the wishes of Government, they are noted below:—

		Rs.	Rs.
1.	Bund to protect town of Khaira Garhi	1,442	
2.	Surveying a new canal in Upper Sind Frontier	1,561	
			3,003
3.	Widening Deharwah	7,573	
4.	Making a diversion in 4th mile, Sukkur Begári Bund...	4,585	
5.	Compensation for land for do. ...	1,392	
		5,977	
			13,550
6.	New loop, Jhali bund	60,280	
7.	New head regulator over Fordwah	6,999	
			67,279
8.	Sluice over Arthurwah	800	800
9.	New loop, Mithu bund	3,139	14,081
10.	„ Magsi bund	10,942	
11.	New head and regulator to Dambrowah		10,799
12.	Improvements to the Upper Nurwah		6,015
13.	Baghar new cut to supply Kara creek and strengthening Katiwah		5,849
14.	Masonry heads to water-courses, left bank bund		10,020
15.	Compensation for land taken up for Maroh bund, right bank...	793	
16.	Bund to connect Sumarki and Agamani bunds	194	
17.	New loop, Bukerani bund...	175	
			1,162
	Total ...		1,32,558

The object of work No. 1 is as stated, namely, to protect the town of Khaira Garhi from hill floods, and therefore no return is expected from the outlay. The outlay on work No. 2 shows the cost of survey of Jacob Canal as sanctioned,

Both these works are undoubtedly "Works" for which neither "Capital or Revenue accounts are kept," but in the returns received from the Examiner, Public Works Accounts, they are shown against Kashmor bund, as if they were part and parcel of that work, which is not correct. However, to avoid disagreement in classification, the outlay on both these items have been recorded in Table IV against Kashmor bund for the present, as the Examiner has done.

The widening of the Deharwah has for its object a better supply to an area of over 20,686 acres of land, already under cultivation at the tail of the canal, where the supply has always been scanty and precarious, and also an actual increase of cultivation all along the improved canal.

The diversion to the Sukkur-Begári bund was carried out to avoid a dangerous bend, at a certain point near the Rahuja regulator.

The new loop Jhali bund was commenced in 1887-88, owing to the steady encroachments of the Indus. The greater portion of the old Jhali bund and two loops constructed in 1887 were carried away during the year, and the village of Madeji also, entailing considerable loss of land and property belonging to the zamindárs and residents in and about the locality. The country and the North-Western Railway were thus left unprotected, and hence arose the necessity for the construction of the new loop. The bund, together with two sluices and one inspection chauki, was completed in 1888-89.

The necessity for the new head regulator over the Fordwah arose from the fact that by the middle of January 1889 the river eroded so rapidly at the mouth of this feeder that it had only to advance a distance of 1,380 feet to carry away the old regulator. The new regulator has been constructed in line of the existing Phulu bund and proposed Mithu bund, at a distance of 1 mile 1·360 feet from the river, with the object of protecting the Ghar and the land irrigated therefrom.

The object of the sluice over the Arthurwah is to regulate the supply at 4 miles 7 feet, as, in the absence of it, the embankments in the lower reaches of the canal were subject to breaching, owing to the pressure of water caused by the closing of the 7 mile regulator.

The Mithu bund new loop was rendered necessary owing to the rapid erosion of the Indus, and portion of the main bund having been washed away in consequence.

The necessity for the new loop Magsi bund arose from the fact of the steady encroachment of the Indus opposite the villages of Magsi and Perozshah, and the old Magsi bund having been partially eaten away.

The object of the new head to the Dambro may be explained thus. The Dambro is an old canal in the Hyderabad Collectorate, watering lands in the Naushahro and Moro Tálukas. It was fed by a branch of the river Indus, which gradually silted up and had to be cleared in 1874. But owing to the erosion of the river, silt deposits were thrown into this mouth, and the supply decreased annually, affecting the revenue seriously. It was therefore proposed to cut a new mouth to the canal, with the object of securing the old revenue and getting a further supply for new lands fit for cultivation lying along the course of the canal and its branches. The sluice at the head is intended to regulate the supply and prevent the country from being flooded in high inundations. This will also serve as a road bridge for the road from the villages of Taga to Manjit and Bhorti.

The improvements to the Upper Nurwah was carried out with a view to increase the supply in the canal, and thus bring more land under cultivation and increase the revenue accordingly. From this work it is expected that an area of 2,306 acres unoccupied land and 1,200 acres of culturable waste will be brought under cultivation when it is in operation: as a matter of fact, in the current season there has been a very considerable increase of cultivation.

The works comprising the expenditure of Rs. 5,849 shown against Baghar in Table IV are two, namely, (1) new cut from Baghar to Kara creek (Rs. 3,371),

and (2) straightening the Katiwah (Rs. 2,478). The object of the new cut is to prevent the afflux of salt water at high tides by constructing a bund across the creek where salt water reaches; and by this means to bring gradually under cultivation about 5,000 acres of waste land at the tail of the creek, which remain uncultivated owing to want of water for irrigation, the anticipated revenue being an immediate return, on completion, of Rs. 2,500 and a future one of Rs. 5,000.

The straightening the Katiwah has for its object increasing the velocity and so improve the supply, and also lessen the quantity of clearance to be carried out annually.

The object of masonry heads to water-courses and canals passing through left bank bunds is to enable cultivation to be carried on without any risk of breaches. This is a part of the scheme sanctioned in Bombay Government Resolution No. 24 W. I.—52 of 1886. Up to the end of the year under review Rs. 40,589 were spent, leaving Rs. 4,642 to be expended in the current year.

The works shown under items 16 and 17 need no remarks.

35. Before concluding this paragraph, it appears desirable to draw attention to the fact of the annual expenditure on the Jhali bund being regularly debited to the Ghár Canal. The project for this bund was at the outset included incorrectly in the Ghár Canal project, and the charges were debited accordingly; but it seems to be wrong in principle, as the Jhali bund is in itself as independent as any similar work in the Ghár districts, and the time appears to have arrived to relieve the Ghár Canal of the burden of the heavy charges connected with the Jhali bund, which ought to form a separate item and be shown under the head "Bunds, Right Bank." If this is done, the net revenue of the Ghár of course will show better results than at present.

36. In the reports for former years it was not customary to record the capital expenditure incurred on major works and minor works for which capital and revenue accounts are kept, but in order to render this report as full as possible, the expenditure incurred in the year under review on such works is given below:—

Major Works.

	Rs.
Begári Canals District	31,544
Eastern Nára District	60,809
Total ...	92,352

The expenditure shown against the Begári Canals district has been incurred on the following works:—

Desert.

	Rs.	Rs.
1. Widening the main canal, closing flood openings, &c.	30,580	
Embankment from 39½ to 47½ miles of main canal to keep main flood out of the channel	791	
		31,371
Unharwah.		
2. Masonry sluices		173
Total ...		31,544

The expenditure shown against the Eastern Nára districts was incurred on the following works:—

Nára Canal.

	Rs.	Rs.
3. Construction of 5 Kariah heads ...	1,924	
4. Closing Jatri opening and strengthening the Bedi, Lunar, Kundu and Changal bunds	3,160	
		5,084

Mithrau Canal.

	Rs.	Rs.
5. Road bridges in miles 3 and 6 of left bank branch of the 9th mile ...	1,380	
6. Iron girder road bridge on 28 mile near Sindri	948	
7. Left bank branch at 9th mile ...	3,216	
8. Protective embankment up to tail sluice .	5,565	
9. Arrears of last year	32	
		11,141

Dimwah.

10. New regulator and road bridge at 18th mile	2,510	
11. Three road bridges at miles 2, 4 and 10...	5,076	
12. Excavation due to extension and improvements	26,683	
		34,269

Thar Canal.

13. Regulating bridge at 6th mile Kejrari branch	1,925	
14. Road bridges in miles 2, 1 and 3 of branch canals	779	
15. Inspection bungalow at Sufi and out-houses, Nurwah	2,050	
16. 2nd mile branch canal	3,578	
17. Three Kariah heads, one on main canal and two on branch canals	1,982	
		10,314
Total ...		60,808

Expenditure on Minor works for which Capital and Revenue accounts are kept has been incurred in the Fuleli districts only, and it is noted below :—

	Rs.
1. Regulator at head of new Fuleli	45,735
2. Regulator at head of the Kaziawah	1,265
Total ...	47,000

37. The regular establishment charges of the Department on the revenue and agricultural expenditure of the year, as shown in Table IV, amounted to Rs. 2,97,722, the details of which are given below :—

	Rs.
Direction	52,709
Executive	2,42,187
Tools and plant	2,826
Total ...	2,97,722

or practically the same as in the past year, when they amounted to Rs. 2,97,792. The reason for this is that the executive establishment charged to revenue and agricultural works in the year under review has considerably increased over that for the previous year, especially in the Eastern Nára districts, under the orders of Government conveyed in Government Resolution No. 99-A.I.—1275 of 23rd July 1889.

The excessive percentage in this district (the Eastern Nára) is due to the fact that as there was still a considerable sum to be expended on new works, and as a large amount was provided for in the draft budget for 1888-89, it was hoped that the percentage on establishment charges would be greatly reduced in that year, thus making up for the deficiency of the previous year. Government however budgetted Rs. 1,39,000 in 1888-89, but sanction to the Dimwah project having been received late and sanction to the Khipra Canal project not having been received until the beginning of 1889-90, the expenditure against Rs. 1,39,000 was only Rs. 60,808, and therefore the percentage of establishment

charges ran up as a matter of course. With a view, however, to deal with the entire establishment charges of the Department in Sind by a comparison with the charges for the past year, the following classified table is given :—

Table G (3).

District.	Capital Expenditure.									
	1887-88.					1888-89.				
	Outlay.	Establishment Charges.				Outlay.	Establishment Charges.			
		Executive.	Per-centage.	Direction.	Per-centage.		Executive.	Per-centage.	Direction.	Per-centage.
1	2	3	4	5	6	7	8	9	10	11
	Rs.	Rs.		Rs.		Rs.	Rs.		Rs.	
Begári Canals	61,054	9,367	15·3	3,052	5	31,544	4,732	15	1,578	5
Shikárpur Canals	....	....	..	....	..	....	....	..	..	..
Ghár Canals	....	....	..	....	..	....	....	..	..	..
Eastern Nára Canals	78,422	30,912	39·4	3,921	5	60,808	12,159	20	3,040	5
Hyderabad Canals	....	....	..	....	..	....	....	..	..	..
Fuleli Canals	....	....	..	....	..	47,000	7,050	15	2,350	5
Karáchi Canals	....	....	..	....	..	....	....	..	..	..
Total ..	1,39,476	40,279	..	6,973	..	1,39,352	23,941	..	6,968	..

District.	Revenue and Agricultural Expenditure.									
	1887-88.					1888-89.				
	Outlay.	Establishment Charges.				Outlay.	Establishment Charges.			
		Executive.	Per-centage.	Direction.	Per-centage.		Executive.	Per-centage.	Direction.	Per-centage.
1	12	13	14	15	16	17	18	19	20	21
	Rs.	Rs.		Rs.		Rs.	Rs.		Rs.	
Begári Canals	1,71,819	32,586	18·9	10,332	6	1,20,706	39,893	33·0	6,060	5
Shikárpur Canals	1,62,574	34,871	19·9	11,375	7	68,251	28,937	42·4	3,358	4·9
Ghár Canals	1,37,702	31,798	16·9	13,289	7	2,36,524	43,099	18·2	11,847	5
Eastern Nára Canals	34,581	17,647	51·1	2,448	7	46,891	34,675	73·9	2,359	5
Hyderabad Canals	1,39,021	29,230	21·0	9,853	7	2,30,590	30,672	13·3	11,604	5
Fuleli Canals	1,92,977	27,808	14·4	13,681	7	2,02,430	23,585	11·6	10,149	5
Karáchi Canals	3,20,297	39,167	12·2	22,655	7	1,47,615	41,326	28·0	7,382	5
Total ..	12,08,921	2,10,607	..	83,633	..	10,53,007	2,42,187	..	52,709	..

Note—The charges in this statement are exclusive of Tools and Plant.

38. The percentage on the executive establishment charges of the Begári, Shikárpur, Karáchi Canals in general and the Eastern Nára in particular are remarkable ; but as reasons for this have been explained above, any comment on them appears unnecessary. The percentage on direction is small and calls for no remarks ; but the charges for both the years under this head may be compared as follows :—

	1887-88.	1888-89.
	Rs.	Rs.
Chief Engineer for Irrigation	30,096	...
Superintending Engineer in Sind	26,857	29,718
Secretariat	33,653	29,959
	90,606	59,677

The reduction on the charges thus is Rs. 30,929 ; and this is due to the irrigation works in Sind having been relieved, in the year under review, of the share of cost of the establishment of the Chief Engineer for Irrigation formerly debited to them, that appointment having been amalgamated with the office of the Superintending Engineer, Central Division, and the powers of a Chief Engineer granted (without pay) to the Superintending Engineer in Sind.

39. The following table shows percentage of expenditure on revenue, and cost of maintenance per acre, based on the outlay incurred on maintenance and repairs, and public works establishment, and tools and plant, and cost of revenue collection :—

Table H.

Years.	Cultivation.	Total Canal Revenue assessed.	Expenditure.			Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.
			Maintenance and Repairs.	Revenue Collection.	Total.		
	Acres.	Rs.	Rs.	Rs.	Rs.		
1882-83	1,673,293	33,38,844	10,91,027	2,72,652	13,63,679	40·84	0·82
1883-84	1,540,831	33,07,052	10,92,944	2,74,762	13,67,706	41·36	0·88
1884-85	1,783,173	37,73,166	10,67,474	3,36,613	14,04,087	37·21	0·79
1885-86	1,739,919	35,77,341	10,79,672	3,16,215	13,95,887	39·02	0·80
1886-87	1,814,650	37,77,985	10,99,852	3,29,394	14,29,246	37·83	0·80
1887-88	1,871,114	38,78,084	13,02,617	3,42,170	16,44,787	42·4	0·88
Average ...	1,737,163	36,08,745	11,22,264	3,19,968	14,34,232	39·7	0·83
1888-89	2,118,635	44,69,436	11,81,720	3,91,630	15,73,350	35·2	0·74

The maintenance and repairs, and establishment, and tools and plant charges of the year, compared with the average of six previous years, is less by Rs. 59,456 and compared with the past year the decrease is Rs. 1,20,897, and the percentage of expenditure, inclusive of collection charges on revenue and cost of maintenance per acre, show therefore better results. The assessed revenue of the year being greater than that of the past year and the average of six previous years, the collection charges as a matter of course have gone up, and need no remarks.

40. The following table shows the financial results of irrigation works in the province for the year under review:—

Table I.

Class of Works.	Gross Revenue.	Working Expenses.	Net Revenue.	Simple Interest.	Net Profit.
	Rs.	Rs.	Rs.	Rs.	Rs.
Major Works (Productive Works) ...	10,04,838	2,89,076	7,15,762	3,23,670	3,92,092
Minor Works, Irrigation and Navigation, for which Capital and Revenue Accounts are kept	11,24,685	6,12,211	5,12,474	...	5,12,474
Minor Works, Irrigation and Navigation, for which only Revenue Accounts are kept	19,19,572	8,01,918	11,17,654	...	11,17,654
1888-89...	40,49,095	17,03,205	23,45,890	3,23,670	20,22,220
1887-88...	34,94,180	17,53,349	17,40,831	3,17,639	14,23,192
Difference ...	+5,54,915	−50,144	+6,05,059	+6,031	+5,99,028

The gross revenue of the year, which excludes the average net revenue before improvement on the Works for which Capital and Revenue accounts are kept, shows an increase of Rs. 5,54,915 over that of the previous year. The working expenses of the year, which include indirect charges (leave and pension allowances), are less by Rs. 50,144, and the net revenue is Rs. 6,05,059 more than in the previous year; deducting from this the interest charges, the net profit is Rs. 5,99,028 for the entire canal system of the province. From the general abstract of financial results (*vide* Appendix) it will be seen that although for the year under report the Eastern Nára works show a net profit of Rs. 75,998, there is an accumulated deficit of Rs. 7,81,287 up to the end of that year. In the past year the deficit was Rs. 8,57,285. The reduction therefore is Rs. 75,998; and judging from the rapid spread of cultivation in this district, there is every reason to expect that the deficit will be cleared off in a few years. In 1882-83 the deficit on the Eastern Nára works was Rs. 10,23,706, which shows an improvement in six years of Rs. 2,42,419.

41. With a view to show what degree of financial efficiency the two classes of works (Major and Minor works for which Capital and Revenue accounts are

kept) noticed in the preceding paragraph, have attained, the following table is added :—

Table J.

Canals.	Area irrigable by the complete project.	Area irrigated during 1888-89.	Excess area irrigated.
	Acres.	Acres.	Acres.
Major Works.			
Desert Canal	109,500	113,155	3,655
Unharwah	18,000	43,172	25,172
Begári Canal	104,000	201,718	97,718
Eastern Nára Works	212,631	217,700	5,069
Total ...	444,131	575,745	131,614
Minor Works.			
Sukkur Canal...	About 600,000	83,770	76,099
Ghár Canal		211,365	
Fuleli Canals		288,584	
Mehrabwah		14,188	
Alibhar Kacheri		6,853	
Marak		46,660	
Sarfraz		24,679	
Total ...	600,000	676,099	76,099

It will be seen that on all the major works the areas anticipated as irrigable have been far exceeded by the completed projects, the Unharwah and the Begári canals being foremost in this respect; and judging from the general tendency of the cultivation in the Upper Sind Frontier and in the Eastern Nára districts, there is hardly any doubt that the area will go on increasing from year to year as far as the water-supply will admit, and within a few years show still larger results. The details for each minor work, as to the area irrigable by the projects, are only available in the abstract; but the excess area of 76,099 irrigated on these works is very satisfactory.

42. While the table given in the above paragraph represents the area of cultivation realized only, the following table represents the financial results, for the same classes of works, on the capital outlay to the end of the year under review :—

Table J (1).

Canals.	Capital outlay to end of 1888-89.	Gross Revenue.				Working Expenses.			Net revenue.	Deduct average receipts before improvements.	Balance or net revenue due to capital expenditure.	Percentage of net revenue on capital outlay.
		Irrigation.		Plantations and Miscellaneous, less refunds.	Total.	Direct.	Indirect.	Total.				
		Government lands.	Jághir lands.									
1	2	3	4	5	6	7	8	9	10	11	12	13
Major Works.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Works.												
Desert Canal	12,54,874	1,22,557	70,102	264	1,92,923	39,436	1,181	40,617	1,52,306	...	1,52,306	12·14
Unharwah	3,39,128	77,941	26	18	77,985	23,478	620	24,098	53,887	...	53,887	15·89
Begári Canal	16,73,079	3,05,479	50,494	477	3,56,450	92,914	2,662	95,576	2,60,874	24,856	2,36,018	14·11
Eastern Nára Canals... ...	51,61,311	3,88,977	986	15,817	4,05,780	1,23,600	5,185	1,28,785	2,76,995	3,444	2,73,551	5·30
Total, Productive ...	84,28,392	8,94,954	1,21,608	16,576	10,33,138	2,79,428	9,648	2,89,076	7,44,062	28,300	7,15,762	8·49
Minor Works.												
Works for which Capital and Revenue Accounts are kept.												
Sukkur Canal	13,88,713	1,96,184	824	940	1,97,948	47,239	921	48,210	1,49,738	71,550	78,188	5·63
Ghár Canal	4,40,977	5,84,369	2,094	3,654	5,90,117	2,17,857	7,297	2,25,154	3,64,963	1,16,832	2,48,131	56·27
Mehrabwah	67,869	26,078	6	269	26,353	20,591	363	20,954	5,399	...	5,399	7·96
Alibhar Kacheri Canal ...	23,917	12,371	459	30	12,860	14,788	290	15,078	—2,218	8,427	—10,645	...
Marak Great Canal	2,01,553	88,503	3,929	272	92,709	20,685	916	21,601	71,108	36,459	34,649	17·19
Sarfrazwah	1,24,680	32,748	4,110	258	37,116	18,073	313	18,386	18,730	11,155	7,575	6·08
Fuleli Canal	10,25,928	5,06,605	31,055	4,629	5,42,289	2,57,967	4,861	2,62,828	2,79,461	1,30,284	1,49,177	14·54
Total, Minor Works for which Capital and Revenue Accounts are kept ...	32,73,637	14,46,863	42,477	10,052	14,99,332	5,97,250	14,961	6,12,211	8,37,181	3,74,707	5,12,474	15·65
Total ...	1,17,02,029	23,41,817	1,64,085	26,628	25,32,530	8,76,678	24,609	9,01,287	16,31,243	4,03,007	12,28,236	10·49
Total for 1887-88 ...	1,15,22,262	19,67,675	86,889	25,892	20,80,456	7,33,979	16,957	7,50,936	13,29,520	4,03,007	9,26,513	8·04

It will be seen that the percentages of net revenue on the Desert Canal, Unharwah and the Begári Canal were 12·14, 15·89 and 14·11, which clearly proves them a commercial success. The percentage on the Eastern Nára works, namely 5·30, is not quite so good as the three works first mentioned ; but it may be confidently expected that within a very few years and when all the works comprising the Eastern Nára scheme are completed and in active operation, they will show as good if not a better return than the major works in Upper Sind. Of the seven minor works mentioned in this table, *viz.*, the Ghar, Mehrab, Marak and the Fuleli show the best results, the Ghar being foremost with a percentage of 56·27, and next in order the Marak and Fuleli showing a percentage of return of 17·19 and 14·84. The Alibhar Kacheri shows a net deficit of Rs. 10,645 ; but it must be remembered that the object of the original project for its improvement was to prevent the loss of existing revenue and not to increase it, as a branch of the old canal was nearly obliterated by a sand drift at the head and had to be supplied from another source. This canal should be struck off the return of canals for which capital and revenue accounts are kept. The aggregate return on Major works was 8·49 and on Minor works 15·65, in both cases exceeding the previous year by 2·37 and 2·61 per cent. respectively.

43. The mileages of canals and bunds in the year under review are 5,916 and 613 respectively, against 5,827 and 610 of the previous year. As regards canals the increase is due to 70 miles of Rajwahs of the Desert Canal having been improved and extended ; 6 miles due to excavation of a new branch from 2nd mile Thar Canal ; 7 miles extension of the Dimwah ; 4 miles of diversion from 5th to 9th mile of the Fuleli at head ; and 2 miles of a new cut from the Baghar to the Kara creek. As regards bunds, 2 miles are due to the new loop to the Jhali bund, and one mile to the protective embankments Mithrau Canal.

44. There was very little difference in the average discharges of the canals shown in Table VIII in the Appendix, between 1887 and the year under report. In the Begári District there was an average increase in all the canals of the district of 448 cubic feet per second ; but as the increased acreage cultivated was large, there was a small falling off in the duty done by the water of 0·53 acre per cubic foot per second of discharge, or about half an acre to each cubic foot discharged. In the Sind canal also there was an average increased discharge of 209 cubic feet per second ; but here also, owing to the increased area of cultivation, there was a falling off in duty of 0·37 acre per cubic foot of discharge.

The Sukkur canal shows an average decreased supply of 78 cubic feet per second, and as the cultivation on it increased by 8,133 acres, the water duty as a matter of course was greater, amounting to 5·30 acres per cubic foot above last season. The Ghar, with an increased average discharge owing to the increase of cultivation, shows an increased duty of 0·99. The Ghar is still capable of a considerable increased duty, which it is hoped it will again work up to. The Mithrau shows a decreased discharge with an increased cultivation of 10,941 acres of cultivation ; its duty therefore exceeds last year by 6·84 acres per cubic foot of discharge.

The Hyderabad canal district shows a small falling off in the average discharge of all the canals, and an increase of cultivation, which increased the duty of the water-supply by 5·66 acres per cubic foot of discharge, but still there seems to have been no particular pressure on any canal as their duty averages very fairly with other seasons. There was a small falling off in the Fuleli supply, and although the area cultivated was increased, there was only a small increase in extra duty done of 1·68 acres per foot discharged. There was sufficient water for even a greater increased duty, and the Executive Engineer states that there was no waste. On the whole, Table VIII shows the canals to have worked throughout the province in a most favourable manner.

45. Table IX in the Appendix shows the rainfall in the province for the year, and shows an average fall of 4·32 against 2·84 for 1887-88. The fall was very unevenly distributed and all the heavy fall took place within the influence of the sea breeze. In the Eastern Nára district it was greatest, and even there, where the highest total fall came to 16·89 at Nagar, it did little good to the crops, as it was in a part of the district where there is no cultivation. The

other district which shows a fall of any importance is the southern portion of the Karáchi Collectorate, and that only in Tatta, Mirpur-Sakro, Sujáwal and Keti. The rain in these districts may have been of some use to the rice crops, but this is only problematical. If the heavy fall in the southern districts is excluded from the general fall, the average becomes very low indeed, and proves how very little the crops generally throughout the province benefited from it.

46. The Irrigation Department of the province was, during the year under review, controlled by Mr. George Lambert as Superintending Engineer, with the following executive officers:—

Mr. D. George ...	...	Begári Canals District.
Mr. J. G. Single ...	...	Shikárpur Canals do.
Mr. J. Young ...	...	Ghar Canals do.
Mr. J. A. Coghlan	...	Eastern Nára do.
Mr. J. R. Hatherly	...	Fuleli Canals do.
Mr. J. Tate ...	...	Hyderabad Canals do.
Mr. H. M. Thompson	...	Karáchi Canals do.

BEGÁRI CANALS DISTRICT.

47. *Kashmor Bund.*—The Abkalani establishment for this work was appointed on the 25th May, and dismissed on the 15th September when all danger had ceased. The highest maximum rise of flood against the bund was 4′ 6″ during the season, and is the lowest on record. The maximum against the new loop between 2nd furlong of 36th mile and 7th furlong of 42nd mile reached its greatest height on the 28th July, the water having been admitted through cuts in the old bund to allow the new loop to saturate. The first breach made by the river erosion took place on 22nd July, which continued steadily to enlarge. It was then found necessary to cut escape openings in the old bund near the 36th and 37th miles, which allowed the confined water to flow back to the river; and this eased the pressure to such an extent that the increased rise in the river, which occurred on the 27th to 30th of August, did not increase the level of water against the inner or new loop bund. It is now found advisable to alter the dates on which the Abkalani establishment is to be entertained and dismissed, and therefore orders have been issued to commence employing the men when danger from a rise in the river is anticipated, and not till then, and to dismiss them the moment the river turns down for the season. It is hoped that in this way nearly a month's pay yearly of the Abkalani establishment can, with perfect safety, be saved.

48. *Desert Canal.*—This canal was opened on the 26th May, but much use was not made of the supply until the 15th of the following month. The full supply, 11·00, was not reached till the 27th July, after which the supply was fairly steady till the end of August. The average supply from 15th June to 15th September was 1,871 cubic feet per second against 1,453 cubic feet of the past year. The improved Rajwahs, namely, the "New Fall" and the "Bugti," worked well, the result being that the crops were prosperous and abundant.

48*A*. *Muradwah.*—This is a branch of the Desert Canal. Water was admitted on the 26th May, but few Kariahs were opened before the middle of June. The supply was deficient from the 15th to 30th June, but reached the full supply of 6 feet on the 2nd July, after which it remained above full supply till the 7th of September. As much as 8·50 feet was passed down this canal, and on the whole it worked well. The average discharge was 395 cubic feet per second, against 373 cubic feet of the previous year.

49. *Unharwah.*—This canal was opened on the 26th May and worked exceedingly well owing to a good supply in the dhand which feeds it, and the supply therefore from 15th June to 15th September was very steady and never fell below the estimated full supply. This is proved by the fact that the area cultivated during the year was 43,172 acres, yielding an assessed revenue of Rs. 79,195, against 29,406 acres and an assessed revenue of Rs. 53,155 of the previous year, the increase respectively being 13,766 acres of cultivation and Rs. 26,040 of revenue. The average discharge was 1,059 cubic feet per second, against 590 cubic feet in the previous year.

49 *A*. *Begári Canal*.—Water was admitted into this canal on the 26th March, with a view to supply the railway tanks; and this early supply was also utilized in irrigating forest lands on the Nurwah and its branch the Sonewah. There was a good supply of water early in the season, the gauge reading 11·30 on the 4th June; but owing to most of the Kariahs not being opened, much use was not made of it for purposes of cultivation. The maximum supply passed down was 12·85, the full designed supply being 12′. The average discharge was 4,040 cubic feet per second, against 3,156 cubic feet in the previous year. The area cultivated on this canal and its branches was 201,718 acres, the assessed revenue being Rs. 3,45,171 against 157,600 acres and an assessed revenue of Rs. 2,56,671 in the previous year. The increase is due to the supply having been good, and also to improvements to zamindári canals. There are still large areas of waste land under the command of this canal, if a larger supply could be passed down it.

50. *Bakshaliwah*.—This canal was opened on the 9th June. The head regulator in the old bund was washed away by the erosion of the river on the 21st July. The regulator in the new loop was then opened, the canal having been closed for some time to flood the land between the two bunds. The area of cultivation on this and other small canals through the Kashmor bund was 197 acres less than in the previous year. The decrease is due to an interruption in the supply of the Bakshaliwah.

51. The financial results based on realizations of all the canals in this district and the charges against revenue are shown in the following table:—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage on Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1884-85	4,42,476	1,69,984	1,69,984	38·4	38·4
1885-86	4,77,172	1,80,345	1,80,345	37·8	37·8
1886-87	4,44,542	1,7[illegible],780	3,06,078	40·4	68·8
1887-88	4,54,979	1,96,853	2,52,249	43·27	55·44
1888-89	6,34,190	2,12,066	2,15,997	33·44	34·05

The total revenue collected is the best in the series of years given, the increase over the previous year being Rs. 1,79,211. The charges are more than in the previous year; but they are due to increase in the revenue collection charges, which always must increase as the revenue does, being a charge of 10 per cent. on the amount collected.

SHIKA'RPUR CANALS DISTRICT.

52. The report on the inundation left behind by the Executive Engineer (Mr. Single) for the year under review is very meagre and contains little real information of any use. The supply is stated to be "not altogether satisfactory," while the canals show an increased average supply and the kharif area cultivated considerably extended.

53. The *Sind Canal* had an average increased discharge of 209 cubic feet per second, with an increased area of 7,041 acres of cultivation, and as the canals in Rohri worked exceptionally well, with an increased cultivation also, it cannot be traced to what reason the Executive Engineer ascribed an unsatisfactory supply.

54. The encroachment of the river continued on its left bank, and during its final fall in September the banks in Shah Belo scoured considerably, and a great quantity of trees and brushwood were brought down and swept into the Nára supply channel, blocking up the regulating bridge and entailing great labour in keeping it clear. The river spilled over its banks in the lowest places only; there was much ground therefore in front of the Sukkur-Begári and Kasimpur bunds that was not submerged at all. The greatest depth of water against the Sukkur-Begári bund was 2·80 feet at the 3rd mile on the 29th of August;

there was no strain on it, or any of the other bunds of the district. The decline in the rabi area cultivated is due to the lands between the bunds and the river not being sufficiently submerged.

55. The following table shows the revenue collection and charges for the year under review and for four previous years :—

Years.	Total Canal Revenue Collected.	Revenue Charges.		Percentage on Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total charges against Revenue.		
	Rs.	Rs.	Rs.		
1884-85	2,73,536	1,14,899	1,67,241	42·0	61·1
1885-86	2,88,336	1,44,433	1,78,861	50·1	62·0
1886-87	3,18,769	1,62,045	1,84,627	58·3	57·9
1887-88	3,28,082	1,86,771	2,38,852	53·06	72·80
1888-89	3,60,796	1,16,525	1,36,486	32·30	37·82

The collection for the year is the greatest in the series, and compared with the past year the increase is Rs. 32,714. The charges are considerably less than in the previous year; this is due to no outlay having been incurred on works of "Extensions and Improvements."

GHA'R CANALS DISTRICT.

56. As regards this district, the inundation may be said to have commenced favourably; but that, on the whole, it was an exceptionally low one, and were it not for the favourable rises in the end of August and September, the crops would have suffered. These rises, together with heavy dews at the end of August and October, brought the crops to maturity. Generally the canals worked well, and the increases in the area of cultivation of 57,542 acres and assessed revenue of Rs. 1,79,606 are due to this.

57. *River Embankments, Jhali Bund.*—When the river commenced to rise the erosion of this bund was rapid; but by the 15th of September 1888 erosion had almost ceased, and by the end of the inundation the river had left its course, and is now flowing through an old Wahur or side channel at its left bank. The old course is now a dhand; so until the river comes back there will be little or no erosion at Madeji, and the dhand formed, it is hoped, will give a good supply to the Ghar.

58. *Mithu Bund.*—The erosion at this bund during the inundation was great and the bund was cut through on the 27th August. On the 13th August the river was within 200 feet of the bund; and as a rise was anticipated a short loop 4¼ furlongs long was rapidly run up by the assistance of the zamindárs. An area of about 250 acres of cultivation was submerged; but as about 550 acres of rabi have been cultivated from the flood water, there will be no loss of revenue, but rather an increase.

59. *Phulu Bund.*—In March last the direction and strength of the current struck the right bank below the mouth of the Western Nára, but gradually worked up-stream, and at the end of the inundation was rapidly eroding the bank about 2 furlongs above the Nára mouth. During the inundation a distance of 1,262 feet of the Nára was cut away, and 800 feet ably remains between the Phulu bund and present mouth. At the close of the inundation the construction of a short new loop bund seemed advisable; but the river is now gradually receding and eroding the Kacha land on the left bank, and throwing up silt on the right.

60. *Abad Bund.*—There was little water against this bund, and no mishap occurred; consequently no remarks are necessary.

61. *Naugeshah and Magsi Bunds.*—The new Magsi loop sanctioned in Government Resolution No. 66 W.I.—830 of 1888 was immediately commenced; but on account of the lateness of the working season the contractor could not get labour at the low rates sanctioned. However the zamindars supplied sufficient labourers to complete the half section of the bund. The new bund, which is in a low dhora, was breached on the 30th July, but was closed by the 5th August.

62. *Rukan Bund.*—This bund is now in the Karáchi Collectorate, but the maintenance and conservancy of it are attended to in the Ghar districts.

63. *Sukkur Canal.*—This canal was opened on the 8th June. When the canal was opened a breach occurred round the left wing wall of the head regulator at Rahuja; but water was stopped within 24 hours, and the gap was completely filled in by the 10th June. The supply was low from the 15th June to 15th July; but this simply retarded the cultivation. The supply thereafter, with the exception of a few days in August, was very good. The rabi head was opened on the 7th November and worked well. The area cultivated and the revenue (assessed) derived during the year were 82,673 acres and Rs. 1,95,914 against 70,721 acres and Rs. 1,68,122 in the previous year.

54. *Ghár Canal.*—The Ghar was opened on the 1st of June. Considering the low inundation the mouth worked well, and has scoured out considerably; the water only ceased to flow on the 19th October instead of 21st September last year. The canal has been levelled for 11 miles, and the head is to be thoroughly cleared; so with a good dhand as feeder, the prospects for next year, so far as the upper Ghar is concerned and as far as can be seen, are favourable.

65. *The Fordwah.*—Feeds the Ghar below the 28th mile, and as it was cleared during the past season to the pavement of the sluice, the supply was better than for many years. The supply at Lárkhána and in the lower part of the canal, notwithstanding that the supply at the mouth of the Ghar was less than last year, was decidedly better. The result has been a large increase of cultivation in the Kambar and Nasirabad tálukas. The branch canals below the junction of the Fordwah have all had a fair supply, and few complaints were received for want of water. The Chilo especially had a very good supply. The increase in the area of cultivation and revenue of the Ghar Canal was 41,425 acres and Rs. 1,29,579.

66. *Western Nára.*—This canal was opened on the 22nd April and ceased to flow on the 19th October. In the beginning of the inundation the supply was received from the tail of a dhand and was very good; but when the river cut away the dhand, and commenced to erode the mouth rapidly, the supply decreased and was during the rest of the inundation somewhat unsatisfactory. The canal has silted up considerably for 3 miles. The mouth will however be thoroughly cleared, and should the river change its course the prospects for next year will be more favourable. The branch canals worked fairly well, but complaints were received for want of water at the tails of the Gillespiewah, Kakol and Kudan. This was due to the low inundation and the large draw-off near the heads of the canals. Towards the close of the season the Kariahs near the heads were closed for short periods and the Kariahs at the tails supplied by rotation. The new mouth to the Kudan acted very well; but the change from dry to wet crops in the first 12 miles prevented any extra water reaching the lower reach, so that the object of the improvement was defeated. A breach occurred at a zamindari Kariah in the 6th mile of this canal on the 8th June, and was closed on the 14th idem. The whole area submerged was cultivated with rice, and a second "dubari" crop sown. The increase in the area of cultivation and assessed revenue was 1,460 acres and Rs. 21,689.

67. *Wáhur.*—This canal was cut in two parts by the river several years ago, and has decreased very much in section. The upper part derives its supply direct from the river below Chana, and is bunded to prevent the supply again entering the river above the village of Navagote. The channel is now very narrow, but as there are few Kariahs in this part the supply appears sufficient. There was no net increase in the area of cultivation or revenue.

68. *Marriwah.*—The canal formerly derived its supply from the Wáhur; but on account of the deterioration of the latter, it was bunded at the head of the Marvi and a new head excavated for the latter. The present supply of the Marvi is therefore independent of the Wáhur. The head now derives its supply from a dhand in course of formation; the supply was therefore good, and as most of the lands are irrigated by wheel the crops were good. The increase in the area of cultivation and revenue was 413 acres and Rs. 903.

69. The following table shows the revenue collections and the charges against revenue for the year under review and for four previous years :—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage on Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1884-85	13,19,002	3,05,683	3,62,399	23·2	27·5
1885-86	10,37,602	3,06,686	3,63,637	29·6	35·0
1886-87	10,62,799	2,81,910	3,21,351	26·5	30·2
1887-88	10,49,490	2,94,952	3,18,534	28·10	30·4
1888-89	12,25,682	2,93,772	3,95,128	23·96	32·24

The revenue collected in the year is, with the exception of the year 1884-85, the best. The total charges are high, and are due to the outlay on new loop to the Jhali and other bunds of the district.

EASTERN NÁRA CANALS.

70. Water was not admitted into the canals of this district until the middle of June; from this date up to the 25th September a very good supply was maintained. From the 26th of that month water began to fall rapidly owing to the obstruction at the Nára supply channel regulator, noticed in paragraph 54 under the Shikárpur Canals district, causing a difference of 4·5 feet in the up and down stream gauges. Notwithstanding this, which caused an average decrease in the Mithrau Canal of 114 cubic feet per second throughout the season, the canals worked well, the area irrigated and the revenue derived being more than in the previous year by 45,555 acres and Rs. 73,412.

71. The Mithrau Canal was opened on the 15th May, and water gradually admitted to full supply in the middle of June. The increase of cultivation and revenue on this canal, as compared with the previous year, was 16,847 acres and Rs. 29,189. During March a very violent storm burst over the whole of the Nára valley; hundreds of large Bábul trees were blown down, and others whose roots were loosened by the storm came down during the inundation. A large tree fell on the 6th August into the canal, causing a breach in the right bank of the 23rd mile. The flooded land not being under cultivation, no damage was caused to crops. The breach was closed on the 8th August.

72. The *Thar Canal* was opened on the 2nd June, and full supply was admitted at the end of June; the canal worked well. The increase in the area of cultivation and revenue was 13,082 acres and Rs. 22,848.

73. On the *Dimwah* there was an increased area of cultivation and revenue of 578 acres and Rs. 1,151. On the Heranwah the increase was 925 acres and Rs. 1,660.

74. *Nára Embankments.*—The usual establishment was maintained to watch the embankments. No breaches of any consequence occurred. It may be mentioned that an attempt was made to cut the Jamrao Sang bund by some persons interested in the Sákrand Táluka of the Hyderabad Collectorate. The watchmen on the bund, however, succeeded in stopping the damage before much earth had been removed. The men who did the mischief were secured, prosecuted and punished.

75. The following table shows the revenue collections and the charges against revenue for the year under review and for four previous years:—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage on Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1884-85	2,21,625	86,216	86,216	38·9	38·9
1885-86	2,35,204	87,327	87,327	37·1	37·1
1886-87	2,75,293	91,036	91,036	33·06	33·06
1887-88	3,31,680	87,063	87,063	23·23	23·23
1888-89	4,05,787	1,23,600	1,23,600	30·46	30·46

The collection for the year is the best of the series of years, and compared with the past year it is Rs. 74,107 more. The charges have increased owing to collection.

HYDERABAD CANALS DISTRICT.

76. The canals in this district, with few exceptions, worked well and gave a sufficient supply of water, the area cultivated and revenue assessed being 334,370 acres and Rs. 6,64,710 against 307,704 acres and Rs. 6,13,847 of the past year: the increase thus is 26,666 acres and Rs. 50,863, and this has been contributed by all the canals of the district. The working of the canals may be noticed individually below.

77. The *Mehrabwah* worked well, though there was to a certain extent a deficiency of water in the end of June and September. The two branches, the Raidho and Garkno, worked very well. The supply in the Raidho had to be decreased at one time to prevent breaching.

78. The *Nasrat* worked well and had a good supply. The new head excavated in the previous season was widened 10 feet. When water was first admitted some small breaches occurred both on the main canal and on its branch, the Fatima. These breaches occurred at heads of Kariahs, and until the zamindárs build masonry heads to them breaches will inevitably occur. All the branches have had a good supply.

79. The *Naolakhi* worked satisfactorily also. Its head is from a Wáhur, which gives a good supply without silting to any extent.

80. The *Dámbro* worked better this season than might have been expected; this was mainly due to a change in the set of the river. For some years it has been setting in at the mouth of this canal, and the heavy silting thus caused reduced the discharge. In the year under review the river shifted to the right bank, and the Dámbro was fed from a Wáhur.

81. The *Dadwah* worked very well. The change in the river, referred to in the case of the Dámbro, also affected this canal; and now it has its head from a Wáhur instead of from the river itself.

82. The *Renwah* worked very badly. The mouth of the canal takes off from the Nasri dhand, which receives its supply from a Gháro called the Alibhar Myle, which was cleared last year; but it did not work well owing to the river having cut in very heavily above its mouth near the village of Thatt. The Gháro was heavily silted and the supply in the Renwah was consequently much decreased. The improvements about to be carried out to this canal will put matters right, and the working of the canal next season will, it is expected, be very satisfactory.

83. The *Marak* gave a good supply owing to a new head having been cut. This canal is said to have had a better supply than most of the canals in this district; it did not cease to flow till the end of October. Its branches, in the Shahdádpur Táluka especially, have had a good supply.

84. The *Alibhar Kacheri* had a better supply than usual. Till last season the Gharo which feeds this canal was also the main source of supply to the Marak; and as the latter is considerably lower than the former, it got a less share of the water. The new mouth to the Marak, while reducing the demand on the old Gharo, increased the supply in the Alibhar Kacheri. The revenue result of this canal however is very unsatisfactory, as owing to its necessarily heavy working expenses, and the deduction of the average revenue before improvements, it annually shows a deficit on the capital charged against it, the deficit in the year under revenue being Rs. 10,645.

85. The *Gharo Mahmuda* has also worked well.

86. The *Nasirwah* worked well at first; but owing to a change in the course of the river, the supply fell short towards the end of the season on the tails of some of the branches.

87. The *Sarfraz* had a good supply in the beginning of the season, but in the end of August the river cut in at its head and caused a heavy deposit of silt in it, and early in September it ceased flowing.

88. The area irrigated and the revenue assessed on the above canals are recorded in Table VII, and a reference to Table VII-A will show the net results.

89. The financial results and the charges against revenue are shown in the following table for the year under review and for four previous years :—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage on Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1884-85	6,35,855	2,37,841	2,51,853	37·4	39·6
1885-86	6,18,608	2,08,670	2,11,177	33·7	34·1
1886-87	6,27,340	2,33,164	2,33,164	37·1	37·1
1887-88	6,40,454	2,37,242	2,37,288	37·04	37·05
1888-89	6,93,687	3,24,064	3,36,922	46·72	48·57

The revenue collection of the year is the best of the series, and compared with the past year the increase is Rs. 53,233. The charges are high owing to increased collection and to increased outlay on maintenance and repairs, and also to expenditure under head "Extensions and Improvements."

FULELI CANALS DISTRICT.

90. The *New Fuleli* was opened on the 10th of May, the old upper head to the same canal on the 9th of June, and the other small canals taking from the river on various other dates and as early as water would flow in them. The supply in the canals, although below the average, was better than in the previous season, in the Hyderabad and Dero Mohbat Tálukas. It was up to the average in the Guni Táluka, a circumstance due chiefly to increased clearance to the Indus Canals, while the supply in the Bago Tando and Badin Tálukas was very good and steady in all main canals, although intermittent and somewhat insufficient in the lower reaches of some of the branches. Of the Indus Canals the only canal taking off from the river in the Hyderabad Táluka is the Chandan, and it has nominally six branches. This canal flowed from the 13th to 17th June, and from 7th July to 12th September. The break of 18 days at the beginning of the season delayed sowing till the middle of July, leaving only two months' irrigation to bring the crops to maturity, instead of 2½ months. The Chandan, as noted above, has six branches; but the supply to four of them, the Ali Thaim, Jindo, Kangan Kadi new, Kavhgi and Shaitanwah, is now derived from the flooded area of Miani forest, which is thus drained to the detriment of that forest.

91. The *Mirwah* in the Guni Táluka was well cleared and the crops were good. It was flowing almost continually from 23rd to 10th September; but it ran dry at the end of June and beginning of July owing to the low level in the river.

92. The *Wassingwah* was also well cleared and was opened on the 23rd of May, and was flowing in September. The crops on it were good in condition.

93. The *Nurwah*.—This canal was similarly well cleared as the above; but it silted considerably along the first two miles, owing to the water surface at Kathiar being raised artificially by means of a regulator across the canal.

94. The *Hasanaliwah* is a large and important canal. The water-way along the last few miles had been gradually allowed to contract, and the canal banks to become impassable from thick jungle. Special attention was therefore paid to these points during the working season of 1888-89. The supply fell short in September, but the crops were good.

95. The *Khairwah* is as important as the Hasanali, and like it the lower portion of this canal was allowed to deteriorate. It will be widened in the current working season below the 10th mile. Two breaches occurred, one at the 6th and the other at the 9th mile; they were both closed within 24 hours. There is every season a deficiency of water at the tail of this canal, but after completion of the widening the supply will be equal to the demands on it.

96. The *Khokarwah* irrigates land lying to the south of Khairwah which might equally well be cultivated from that canal. It is in tolerably good order and the crops on it were good.

97. The *Baghiar* flows through Jághír lands along its entire length; it is only the last mile which supplies Government land. To enable this canal to work, it was found necessary to cut a channel through a bank thrown up by the river, which extended from the north of this canal to somewhat south of the head of the Mulchand. This cut enabled it to work fairly well, and the crops were good. The above remarks apply to the Dhadko also. Both these are unsatisfactory canals, which, even when cleared to their bed-stones, give unsatisfactory results; but no suggestions can be made for their improvement as there is no fall in the country they supply.

98. The *Mulchand* is the second largest canal taking off from the river. The main canal and branches were cleared to an exceptional extent last season, and a long channel was cut to the river through the mud bank thrown up by the river opposite its head.

99. The area of cultivation and assessed revenue on the canals of this district for the year under review were as follows:—

	Acres.	Assessment.
		Rs.
1888-89...	252,494	5,46,719
And the past year's...	237,060	5,29,157
Showing an increase of	15,434	17,562

So that on the whole the results of the year are favourable.

100. The *Hajipur bund* gave no trouble throughout the season, because the river never rose sufficiently high to put it to any serious test. The cost of maintenance therefore was only Rs. 196 for the season.

101. The financial results and the charges debitable to revenue on the canals in this district for the year under review and for the four preceding ones are given in the following table:—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1884-85... ...	4,17,606	2,32,754	2,32,754	55·7	55·7
1885-86... ...	4,33,198	2,08,605	2,08,654	48·2	48·2
1886-87... ...	5,07,009	2,14,374	2,14,374	42·2	42·2
1887-88... ...	5,54,389	2,76,408	2,76,408	49·86	49·86
1888-89... ...	5,86,517	2,81,063	2,81,063	47·92	47·92

The revenue collected during the year is the best of the four previous years; compared with the past year the increased collection is Rs. 32,128. The charges show an increase of Rs. 4,655: this is due to the increased collection.

KARA'CHI CANALS DISTRICT.

102. The inundation may be described as follows, as regards the canals and bunds of this district. During the whole season the river remained below the height necessary to give a full supply in all canals, with the exception of about 12 days. In the northern tálukas, namely, Dádú, Johi and Sehwan, there was hardly any rain during the inundation; but in the southern portions of this district there was a fair fall in July and August, which must have helped the crops in these parts. The three northern tálukas again suffered from the failure of supply in the Western Nára, on which they principally depend for their water. The new feeder to this canal has just been sanctioned, and when the work is carried out the present state of affairs will be remedied to a certain extent. The supply in the Upper Nurwah in the northern part of Dádú was considerably reduced by the action of the river which had deserted its mouth. This canal has however now been thoroughly improved, and its section altered to suit the supply at its head, and there will therefore be nothing to complain of in the future as regards either this canal or the Western Nára. No improvement has taken place in the Wahur from which the Aral derives its supply, and the important feeder is gradually deteriorating. The large amount of silt in it prevents it acting as a drain to the Manchar in the low season, as it should do; consequently when the lake is full, it cannot be drained quickly enough for the rabi crop of wheat, which is largely grown in its neighbourhood. There is a project being examined into, for the conversion of the Dunsterwah into a drainage channel for the Manchar; and if it proves successful, an estimate will be sent forward for sanction and allotment of funds, as the enlargement necessary to the channel cannot be carried out from the ordinary clearance grant.

103. In the southern tálukas the Pinyari, which is the only high level canal in the district, worked well, and was almost the only one which did not suffer from the low inundation. The result therefore from the canals for the entire district is not quite as satisfactory as in other districts of the province, the increase in the cultivation being only 7,499 acres and in the assessed revenue Rs. 11,762 only.

There is nothing particular to remark about the river embankments in this district, beyond that they kept out all floods, and even in the gaps remaining in the left bank small temporary bunds thrown up along the edge of the pucca land sufficed to keep out the spill.

104. The following table shows the financial results and the charges for the year and four preceding ones:—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1884-85... ...	5,40,517	2,56,710	3,16,527	47·5	58·6
1885-86... ...	5,41,894	2,59,772	3,29,127	47·9	60·7
1886-87... ...	5,62,169	2,66,937	3,28,878	47·4	58·5
1887-88... ...	5,44,789	3,64,498	4,37,489	66·80	80·30
1888-89... ...	5,52,294	2,22,260	2,53,163	36·62	45·84

The collection, with the exception of one year, is the best in the series, and compared with the previous year the increase is Rs. 7,505. The total charges are less than the previous year by Rs. 1,84,326, owing to less expenditure on maintenance and repairs, and extensions and improvements.

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer in Sind.

Camp Sita, 22nd December 1889.

TABLE I.

Cultivation and Water-share of Net Consolidated Revenue for 1888-89 and three previous years.

Canals and Districts.	1885-86.		1886-87.		1887-88.		Average.		1888-89.	
	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
Begári Canals ... Desert Canal	53,125	93,469	39,568	65,311	50,107	89,722	47,600	82,834	69,175	1,24,214
Unharwah	11,831	21,389	24,322	43,773	29,406	53,155	21,853	39,439	43,172	79,105
Begári Canal	143,787	2,84,554	135,066	2,51,196	126,237	2,30,789	136,697	2,55,513	163,264	3,10,119
Kashmor Bund	5,872	10,812	5,269	9,652	3,840	6,958	4,993	9,141	3,625	6,634
Shikárpur Canals. Canals in Rohri	60,554	1,38,879	65,598	1,62,327	76,634	1,88,096	67,595	1,63,101	82,078	2,03,550
Bunds in Rohri	3,749	8,334	...	...	...	...	1,250	2,778	...	...
Sind Canal	49,642	1,33,824	53,025	1,46,036	48,912	1,34,377	50,526	1,38,079	55,055	1,51,586
Sukkur-Begári Bund... ...	...	...	...	...	...	...	...	...	...	...
Ghár Canals Sukkur Canal	57,654	1,37,501	66,204	1,61,967	70,721	1,68,122	64,860	1,55,863	82,673	1,95,914
Ghár Canal	168,912	4,81,088	170,300	4,79,818	162,960	4,56,605	1,617,391	4,72,502	204,388	5,86,184
Nára	118,485	3,69,262	123,668	3,70,959	127,008	3,80,567	123,054	3,73,696	131,168	4,02,556
Wáhur	7,001	17,140	6,936	16,671	6,519	15,847	6,818	16,553	6,166	15,570
Marvi	3,709	9,892	3,816	10,021	3,689	9,503	3,738	9,805	4,102	10,406
Bunds, right bank	46	80	87	147	113	175	82	134	55	95
Eastern Nára Canals. Nára Supply Channel ...	2,139	5,525	1,633	4,334	2,462	6,238	2,095	5,366	3,038	7,683
Eastern Nára	12,168	18,281	18,438	26,704	24,760	34,837	18,455	26,607	38,307	52,068
Mithrau Canal... ...	78,292	1,46,411	87,707	1,74,587	104,992	2,05,587	90,330	1,75,528	121,839	2,34,776
Thar Canal	25,282	42,291	22,389	45,918	31,785	62,352	26,485	50,187	44,867	85,153
Dimwah...	2,165	3,780	2,269	3,832	2,571	4,159	2,335	3,924	3,149	5,310
Heranwah	557	902	703	1,175	1,575	2,629	945	1,569	2,500	4,289
Hyderabad Canals. Mehrabwah	12,743	23,746	11,858	21,110	12,732	23,181	12,445	22,679	14,100	26,078
Nasrat	16,103	38,806	17,607	41,876	18,767	44,760	17,493	41,814	22,638	53,202
Naolakhi	45,674	1,00,899	46,018	1,01,022	48,853	1,07,778	46,848	1,03,233	51,058	1,14,691
Dambro	5,968	12,884	6,872	14,597	7,123	15,172	6,656	14,218	7,449	16,412
Dad	17,874	36,974	20,637	43,011	22,651	45,819	20,387	41,935	24,925	52,404
Ren	17,444	33,246	19,193	35,834	14,998	29,335	17,212	32,805	13,843	26,490
Alibhar Kacheri ...	6,652	13,692	6,478	13,298	5,729	12,206	6,286	13 065	5,958	12,571
Marak	36,958	81,472	36,295	80,656	35,708	78,685	36,320	80,271	40,744	88,508
Gharo Mahmuda ...	49,318	91,948	46,116	86,741	45,023	91,282	46,819	89,990	48,938	97,091
Kari Shumali	25,753	38,203	28,305	37,805	28,694	40,434	27,554	38,814	34,416	46,661
Nasir	24,226	42,842	25,730	43,401	26,431	47,875	25,462	44,706	27,870	49,410
Sarfraz	18,625	26,422	19,441	28,598	18,004	28,987	18,690	28,003	19,530	32,748
Other Canals	33,601	52,168	25,023	52,103	23,076	48,333	28,900	50,868	22,901	48,584
Fuleli Canals ... Fuleli	172,055	3,57,111	199,157	4,36,382	220,540	4,88,618	197,251	4,27,537	234,577	5,08,261
Other Canals	14,347	35,374	15,109	37,300	16,520	40,539	15,325	37,738	17,917	43,458
Karáchi Canals. Nára	71,165	1,53,830	72,368	1,62,905	55,957	1,28,451	66,497	1,48,395	56,006	1,18,230
Phitta	4,950	9,248	4,872	9,642	5,282	10,130	5,035	9,673	4,715	9,043
Canals north of Kotri ...	11,877	22,572	13,385	25,581	14,354	28,154	13,205	25,436	14,410	28,089
Kalri	7,019	17,497	9,122	20,430	8,359	20,831	8,167	19,586	10,660	22,864
Baghar	14,671	28,630	17,285	29,509	16,361	29,273	16,105	29,157	18,867	38,716
Uchita	10,441	24,308	10,742	26,452	10,527	25,433	10,570	25,398	10,335	19,211
Canals in Tatta, &c. ...	8,945	17,011	9,502	17,515	7,566	12,289	8,671	15,605	11,374	19,839
Shal Canals	3,377	8,113	2,814	6,878	2,793	7,107	2,995	7,366	3,021	6,494
Pinyári	56,426	1,39,505	57,137	1,41,772	65,803	1,59,341	59,789	1,46,873	66,928	1,69,268
Canals in Mirpur Batoro ...	9,763	22,742	10,068	24,409	10,845	27,385	10,225	24,845	13,898	32,569
Canals in Sujáwal ...	6,721	15,490	7,028	16,410	6,478	14,942	6,712	15,614	6,868	17,183
Satta	6,518	17,391	7,041	18,011	9,279	18,438	7,613	17,947	8,558	17,327
Canals in Jati	1,217	3,456	1,288	3,268	2,233	5,554	1,579	4,093	2,122	5,728
Khanta	5,092	8,932	5,000	9,545	5,222	12,489	5,105	10,822	4,032	11,325
Kokawari	13,905	28,472	11,797	22,000	12,050	24,052	12,584	24,841	8,211	19,776
Canals in Shahbandar ...	2,452	4,197	2,541	4,124	1,463	3,400	2,152	3,907	1,406	3,370
Bunds, left bank	627	2,050	...	...	...	...	209	683	...	...
Bunds, right bank	245	549	700	2,328	...	...	345	958	...	...
Begári Canals	219,615	4,10,224	204,225	3,69,932	200,590	3,80,624	211,143	3,86,927	270,236	5,20,162
Shikárpur Canals	113,945	2,81,037	118,623	3,08,363	125,546	3,22,473	119,371	3,03,958	137,133	3,56,136
Ghár Canals	355,807	10,14,958	371,011	10,36,583	371,010	10,31,119	365,943	10,28,553	428,562	12,10,725
Eastern Nára Canals...	120,603	2,17,190	133,189	2,56,550	168,145	3,15,802	140,645	2,63,181	213,700	3,89,214
Hyderabad Canals	300,939	5,93,303	309,572	6,00,052	307,704	6,13,847	306,072	6,02,401	334,370	6,64,710
Fuleli Canals	186,402	3,92,485	214,266	4,74,182	237,080	5,29,157	212,576	4,65,275	252,494	5,46,719
Karáchi Canals	235,411	5,23,903	242,780	5,40,837	234,572	5,27,269	237,588	5,30,699	242,071	6,38,031
Total ...	1,532,722	34,33,190	1,593,666	35,89,499	1,653,627	37,20,291	1,593,338	35,80,994	1,887,556	42,25,697

Note.—The figures in this statement are based on assessment.

TABLE II.

Area of Cultivation and Canal Revenue for 1888-89 and five previous years.

Years.	Cultivation.			Water Share of Net Consolidated Revenue.	Hakaba.	Miscellaneous.	Total Canal Revenue.
	Government.	Jághir.	Total.				
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1883-84	1,362,107	178,724	1,540,831	31,68,358	85,134	53,560	33,07,052
1884-85	1,586,279	196,894	1,783,173	36,16,370	1,06,090	50,706	37,73,166
1885-86	1,532,722	207,197	1,739,919	34,33,190	96,037	48,114	35,77,341
1886-87	1,593,666	220,984	1,814,650	35,89,499	1,40,028	48,458	37,77,985
1887-88	1,653,627	217,487	1,871,114	37,20,291	1,12,503	45,290	38,78,084
Average ...	1,545,680	204,257	1,749,937	35,05,542	1,07,959	49,224	36,62,725
1888-89	1,887,556	231,079	2,118,635	42,25,697	1,94,135	49,604	44,69,436
Increase or Decrease ...	+341,876	+26,822	+368,698	+7,20,155	+86,176	+380	+8,06,711

Note.—The figures in this statement, with the exception of Hakaba and Miscellaneous, which are actual realizations, are based on assessments.

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE III.

Area of Cultivation and Canal Revenue for 1888-89.

Canals, Executive Districts and Collectorates.			Cultivation.			Water-share of net consolidated Revenue as in Table VII.	Hakaba.	Miscellaneous.	Total Canal Revenue.
			Government.	Jághir.	Total.				
			Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Frontier, Upper Sind.	Begári Canals	Desert Canal...	69,175	43,980	113,155	1,24,214	70,102	264	1,94,580
		Unharwah	43,172	...	43,172	79,195	26	18	79,239
		Begári Canal...	163,264	38,454	201,718	3,10,119	50,494	477	3,61,090
		Works for which no Capital Accounts are kept ...	...	...	...	...	...	...	...
		Kashmor Bund	3,625	...	3,625	6,634	...	198	6,832
Shikárpur Collectorate.	Shikárpur Canals.	Canals in Rohri	82,078	4,528	86,606	2,03,550	1,939	1,212	2,06,701
		Bunds in Rohri	...	...	...	...	...	5	5
		Sind Canal	55,055	1,752	56,807	1,51,586	1,673	275	1,53,534
		Sukkur Begári Bund ..	...	9	9	...	4	666	670
		Works for which no Capital Accounts are kept ...	...	...	...	...	...	6	6
	Ghár Canals.	Sukkur Canal	82,673	1,097	83,770	1,95,914	824	940	1,97,678
		Ghár do.	204,388	6,977	211,365	5,86,184	2,094	3,654	5,91,932
		Nára do.	131,168	8,719	139,887	4,02,556	3,544	3,104	4,09,204
		Wáhur do.	6,166	...	6,166	15,570	...	12	15,582
		Marvi do.	4,102	...	4,102	10,406	...	2,200	12,606
		Bunds, right bank	55	29	84	95	27	85	207
		Works for which no Capital Accounts are kept ...	...	...	...	...	...	6	6
Thar and Párkar.	Eastern Nára	Nára Supply Channel ...	3,038	1,555	4,593	7,683	870	4,277	12,830
		Eastern Nára	38,307	...	38,307	52,003	...	10,342	62,345
		Mithrau Canal	121,839	...	121,839	2,34,776	...	936	2,35,712
		Thar Canal	44,867	2,445	47,312	85,153	116	252	85,521
		Dimwah	3,149	...	3,149	5,310	...	10	5,320
		Heranwah	2,500	...	2,500	4,289	...	...	4,289
		Works for which no Capital Accounts are kept ...	...	...	...	...	...	7	7
Hyderabad Collectorate.	Hyderabad Canals.	Mehrabwah	14,000	188	14,188	26,078	6	269	26,353
		Nasrat	22,638	658	23,296	53,202	311	369	53,882
		Naolakhi	51,058	2,628	53,686	1,14,691	1,315	185	1,16,191
		Dámbro	7,449	1,074	8,523	16,412	644	164	17,220
		Dad	24,925	5,786	30,711	52,464	3,323	654	56,441
		Ren	13,843	106	13,949	26,490	33	195	26,718
		Alibhar Kacheri	5,958	895	6,853	12,371	459	30	12,860
		Márak...	40,744	5,916	46,660	88,508	3,929	272	92,709
		Gháro Mahmuda	48,938	12,589	61,527	97,091	4,203	883	1,02,177
		Kari Shumali	34,416	9,005	43,421	46,661	4,612	343	51,273
		Nasir	27,870	2,682	30,552	49,410	1,129	159	50,698
		Sarfraz	19,530	5,149	24,679	32,748	4,110	258	37,116
		Other Canals...	22,901	1,751	24,652	48,584	855	206	49,645
		Works for which no Capital Accounts are kept ...	...	...	...	...	...	...	...
	Fuleli Canals	Fuleli	234,577	54,007	288,584	5,03,261	31,055	4,629	5,38,945
		Other Canals...	17,917	914	18,831	43,458	296	180	43,934
		Works for which no Capital Accounts are kept ...	...	...	...	...	...	...	...
Karáchi Collectorate.	Karáchi Canals.	Nára	56,066	8,146	64,212	1,18,230	2,501	7,076	1,27,807
		Phitta	4,715	517	5,232	9,043	38	249	9,330
		Canals north of Kotri ...	14,410	2,276	16,686	28,089	130	69	28,288
		Kalri	10,660	414	11,074	22,864	178	178	23,220
		Baghar	18,867	1,336	20,203	38,715	1,096	172	39,983
		Uchita	10,335	...	10,335	19,211	...	562	19,773
		Canals in Tatta, &c. ...	11,374	1,211	12,585	19,839	489	914	21,242
		Shal Canals	3,021	...	3,021	6,494	...	...	6,494
		Pinyári	66,928	1,937	68,865	1,69,268	778	1,884	1,71,930
		Canals in Mirpur Batoro ...	13,898	...	13,898	32,569	...	10	32,579
		Canals in Sujáwal	6,868	278	7,146	17,183	71	2	17,256
		Satta	8,558	361	8,919	17,327	178	...	17,505
		Other Canals in Jati... ...	2,122	265	2,387	5,720	41	...	5,761
		Khanta	4,632	131	4,763	11,325	91	...	11,416
		Kokawari	8,211	...	8,211	19,776	...	724	20,500
		Other Canals in Shahbandar.	1,406	336	1,742	3,370	161	...	3,531
		Bunds, left bank	...	323	323	...	259	...	259
		Bunds, right bank	...	655	655	...	131	22	153
		Works for which no Capital Accounts are kept ...	...	...	...	...	...	...	...
Begári Canals			279,236	82,434	361,670	5,20,162	1,20,622	957	6,41,741
Shikárpur Canals			137,133	6,289	143,422	3,55,136	3,616	2,164	3,60,916
Ghár Canals			428,552	16,822	445,374	12,10,725	6,489	10,001	12,27,215
Eastern Nára			213,700	4,000	217,700	3,89,214	986	15,824	4,06,024
Hyderabad Canals			334,370	48,427	382,797	6,64,710	24,929	3,987	6,93,626
Fuleli Canals			252,494	54,921	307,415	5,46,719	31,351	4,809	5,82,879
Karáchi Canals...			242,071	18,186	260,257	5,39,031	6,142	11,862	5,57,035
		Total ...	1,887,556	231,079	2,118,635	42,25,697	1,94,135	49,604	44,69,436

Note.—The figures in this statement, with the exception of Hakaba and Miscellaneous Receipts, are based on assessments.

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE IV.

Revenue Expenditure on New Works, Maintenance and Repairs and Revenue Collection Charges in the Civil Department for 1888-89.

Canals and Executive Districts.	Revenue Expenditure.								Total Revenue Expenditure.			
	Improvements.			Maintenance and Repairs.			Revenue Collection Charges in Civil Department.	Total.	Works.	Establishment.		Total
	Works.	Establishment, Tools and Plant.	Total.	Works.	Establishment, Tools and Plant.	Total.				Public Works Department.	Civil Department.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs
Begári Canals. — Desert Canal	...	...	...	18,633	8,544	27,177	12,259	39,436	18,633	8,544	12,259	39,436
Begári Canals. — Unharwah	...	...	...	11,209	4,475	15,684	7,794	23,478	11,209	4,475	7,794	23,478
Begári Canals. — Begári Canal	...	...	...	45,409	19,114	64,523	28,391	92,914	45,409	19,114	28,391	92,914
Begári Canals. — Kashmor Bund	3,003	928	3,931	42,452	13,123	35,575	663	36,238	45,455	14,051	663	60,169
Shikárpur Canals. — Canals in Rohri	7,573	3,583	11,156	23,798	11,326	35,124	20,554	55,678	31,371	14,909	20,554	66,834
Shikárpur Canals. — Bunds in Rohri	...	...	...	1,512	715	2,227	...	2,227	1,512	715	...	2,227
Shikárpur Canals. — Sind Canal	...	...	...	13,445	6,362	19,807	15,321	35,128	13,445	6,362	15,321	35,128
Shikárpur Canals. — Sukkur-Begári Bund	5,977	2,828	8,805	15,946	7,546	23,492	...	23,492	21,923	10,374	...	32,297
Ghár Canals. — Sukkur Canal	...	...	...	28,060	6,681	34,741	12,548	47,289	28,060	6,681	12,548	47,289
Ghár Canals. — Ghár	67,279	15,732	83,011	71,087	16,622	87,709	47,137	1,34,846	1,38,366	32,354	47,137	2,17,857
Ghár Canals. — Nára	800	186	986	48,185	11,218	59,403	40,739	1,00,142	48,985	11,404	40,739	1,01,128
Ghár Canals. — Wáhur	...	...	...	1,417	330	1,747	1,558	3,305	1,417	330	1,558	3,305
Ghár Canals. — Marvi	...	...	...	263	61	324	1,256	1,580	263	61	1,256	1,580
Ghár Canals. — Bunds, right bank	14,081	3,278	17,359	5,352	1,246	6,598	12	6,610	19,433	4,524	12	23,969
Eastern Nára Canals. — Nára Supply Channel	...	...	...	1,707	783	2,490	855	3,345	1,707	783	855	3,345
Eastern Nára Canals. — Eastern Nára	...	...	...	8,807	4,692	13,499	5,876	19,375	8,807	4,692	5,876	19,375
Eastern Nára Canals. — Mithrau Canal	...	...	...	25,370	22,159	47,529	23,441	70,970	25,370	22,159	23,441	70,970
Eastern Nára Canals. — Thar Canal	...	...	...	10,383	9,047	19,430	8,537	27,967	10,383	9,047	8,537	27,967
Eastern Nára Canals. — Dimwah	...	...	...	624	359	983	531	1,514	624	359	531	1,514
Eastern Nára Canals. — Heranwah	...	...	...	...	...	...	429	429	...	...	429	429
Hyderabad Canals. — Mehrabwah	...	...	...	15,344	2,639	17,983	2,608	20,596	15,344	2,639	2,608	20,591
Hyderabad Canals. — Nasrat	...	...	...	9,049	1,725	10,774	5,351	16,125	9,049	1,725	5,351	16,125
Hyderabad Canals. — Naolakhi	...	...	...	17,426	3,323	20,749	11,601	32,350	17,426	3,323	11,601	32,350
Hyderabad Canals. — Dámbro	10,799	2,059	12,858	8,302	1,583	9,885	1,706	11,591	19,101	3,642	1,706	24,449
Hyderabad Canals. — Dad	...	...	...	22,465	4,284	26,749	5,579	32,328	22,465	4,284	5,579	32,328
Hyderabad Canals. — Ren	...	...	...	28,480	5,431	33,911	2,652	36,563	28,480	5,431	2,652	36,563
Hyderabad Canals. — Alibhar Kacheri	...	...	...	12,242	2,106	14,348	440	14,788	12,242	2,106	440	14,788
Hyderabad Canals. — Marak	...	...	...	12,873	2,214	15,087	5,598	20,685	12,873	2,214	5,598	20,685
Hyderabad Canals. — Gharo Mahmuda	...	...	...	30,688	5,852	36,540	10,129	46,669	30,688	5,852	10,129	46,669
Hyderabad Canals. — Kari Shumali	...	...	...	15,909	3,034	18,943	5,130	24,073	15,909	3,034	5,130	24,073
Hyderabad Canals. — Nasir	...	...	...	17,305	3,300	20,605	5,057	25,662	17,305	3,300	5,057	25,662
Hyderabad Canals. — Sarfraz	...	...	...	13,228	2,275	15,503	2,570	18,073	13,228	2,275	2,570	18,073
Hyderabad Canals. — Other Canals	...	...	...	16,480	3,142	19,622	4,944	24,566	16,480	3,142	4,944	24,566
Fuleli Canals. — Fuleli	...	...	...	1,86,431	30,798	2,17,229	40,738	2,57,967	1,86,431	30,798	40,738	2,57,967
Fuleli Canals. — Other Canals	...	...	...	15,999	2,692	18,691	4,405	23,096	15,999	2,692	4,405	23,096
Karáchi Canals. — Nára	6,015	2,051	8,066	9,714	3,312	13,026	12,622	25,648	15,729	5,363	12,622	33,714
Karáchi Canals. — Phitta	...	...	...	1,882	642	2,524	932	3,456	1,882	642	932	3,456
Karáchi Canals. — Canals north of Kotri	...	...	...	5,761	1,964	7,725	2,851	10,576	5,761	1,964	2,851	10,576
Karáchi Canals. — Kalri	...	...	...	9,052	3,086	12,138	2,203	14,341	9,052	3,086	2,203	14,341
Karáchi Canals. — Baghár	5,849	1,994	7,843	7,993	2,725	10,718	3,727	14,445	13,842	4,719	3,727	22,288
Karáchi Canals. — Uchita	...	...	...	213	73	286	2,162	2,448	213	73	2,162	2,448
Karáchi Canals. — Canals in Tatta, &c.	...	...	...	2,749	937	3,686	1,998	5,684	2,749	937	1,998	5,684
Karáchi Canals. — Shal Canals	...	...	...	834	284	1,118	590	1,708	834	284	590	1,708
Karáchi Canals. — Pinyári	...	...	...	23,313	7,948	31,261	17,253	48,514	23,313	7,948	17,253	48,514
Karáchi Canals. — Canals in Mirpur Batoro	...	...	...	1,711	583	2,294	3,201	5,495	1,711	583	3,201	5,495
Karáchi Canals. — Canals in Sujáwal	...	...	...	1,690	576	2,266	1,725	3,991	1,690	576	1,725	3,991
Karáchi Canals. — Satta	...	...	...	3,138	1,070	4,208	1,867	6,075	3,138	1,070	1,867	6,075
Karáchi Canals. — Canals in Jati	...	...	...	352	120	472	467	939	352	120	467	939
Karáchi Canals. — Khanta	...	...	...	2,039	695	2,734	1,188	3,922	2,039	695	1,188	3,922
Karáchi Canals. — Kokawari	...	...	...	1,201	410	1,611	2,025	3,636	1,201	410	2,025	3,636
Karáchi Canals. — Canals in Shahbandar	...	...	...	896	306	1,202	369	1,571	896	306	369	1,571
Karáchi Canals. — Bunds, left bank	10,020	3,416	13,436	17,517	5,972	23,489	15	23,504	27,537	9,388	15	36,940
Karáchi Canals. — Bunds, right bank	1,162	396	1,558	34,514	11,767	46,281	26	46,307	35,676	12,163	26	47,865
Begári Canals	3,003	928	3,931	1,17,703	45,256	1,62,959	49,107	2,12,066	1,20,706	46,184	49,107	2,15,997
Shikárpur Canals	13,550	6,411	19,961	54,701	25,949	80,650	35,875	1,16,525	68,251	32,360	35,875	1,36,486
Ghár Canals	82,160	19,196	1,01,356	1,54,364	36,158	1,90,522	1,03,250	2,93,772	2,36,524	55,354	1,03,250	3,95,128
Eastern Nára Canals	...	...	...	46,891	37,040	83,931	39,669	1,23,600	46,891	37,040	39,669	1,23,600
Hyderabad Canals	10,799	2,059	12,858	2,19,791	40,908	2,60,699	63,365	3,24,064	2,30,590	42,967	63,365	3,36,922
Fuleli Canals	...	...	...	2,02,430	33,490	2,35,920	45,143	2,81,063	2,02,430	33,490	45,143	2,81,063
Karáchi Canals	23,046	7,857	30,903	1,24,569	42,470	1,67,039	55,221	2,22,260	1,47,615	50,927	55,221	2,53,163
Total	1,32,558	36,451	1,69,009	9,20,449	2,61,271	11,81,720	3,91,630	15,73,350	10,53,007	2,97,722	3,91,630	17,42,359

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE V.

Cultivation, Canal Revenue and Expenditure for 1888-89 as contrasted with three previous years.

Canals and Executive Districts.	Average of three previous years.			Percentage of Expenditure on Revenue.	Cost of Maintenance per acre.	1888-89.			Percentage of Expenditure on Revenue.	Cost of Maintenance per acre.	Length in miles of	
	Cultivation.	Canal Revenue.	Maintenance and Revenue Collections.			Cultivation.	Canal Revenue.	Maintenance and Revenue Collection.			Canal.	Bund.
	Acres.	Rs.	Rs.			Acres.	Rs.	Rs.				
Begári Canals. — Desert Canal	83,386	1,14,801	45,337	39·49	0·5	1,13,155	1,94,580	39,436	20·27	0·3	185	...
Unharwah	21,853	39,463	14,028	35·55	0·6	43,172	79,239	23,478	29·63	0·5	67	...
Begári Canal	1,70,971	2,89,596	78,379	27·06	0·5	2,01,718	3,61,090	92,914	25·73	0·5	176	...
Kashmor	4,994	9,271	47,915	...	...	3,625	6,634	36,238	...	..	...	48
Shikárpur Canals. — Canals in Rohri	72,692	1,69,517	67,657	39·91	0·9	86,606	2,06,701	55,678	26·94	0·6	240	...
Bunds in Rohri	1,250	2,779	4,040	...	...	...	5	2,227	...	...	...	54
Sind Canals	55,878	1,41,137	42,833	30·35	0·8	56,807	1,53,534	35,128	22·88	0·6	98	...
Sukkur-Begári Bund	...	222	49,887	...	...	9	670	23,492	...	...	...	36
Ghár Canals. — Sukkur Canal	66,613	1,57,377	37,978	24·13	0·6	83,770	1,97,678	47,289	23·92	0·6	127	...
Ghár	1,72,132	4,78,140	1,42,213	29·74	0·8	2,11,365	5,91,932	1,31,846	22 22	0·6	381	...
Nára	1,31,259	3,79,983	95,781	25·21	0·7	1,39,887	4,09,204	1,00,142	24 47	0·7	238	...
Wáhur	6,819	16,944	3,751	22·14	0·6	6,166	15,582	3,305	21·21	0·5	23	...
Marvi	3,738	11,244	2,475	22·01	0·7	4,102	12,606	1,580	12·53	0·4	15	...
Bunds, right bank	133	199	12,318	...	...	84	207	6,610	...	...	...	114
Eastern Nára. — Nára Supply Channel	3,222	9,869	6,684	67·73	2·1	4,593	12,830	3,345	26·07	0·7	12	...
Eastern Nára	18,455	37,957	15,335	40·40	0·8	38,307	62,345	19,375	31·08	0·5	20	111
Mithrau Canal	90,330	1,76,423	44,974	25·49	0·5	1,21,839	2,35,712	70,970	30·11	0·6	155	93
Thar Canal	27,674	50,912	20,388	40·04	0·7	47,312	85,521	27,967	32·70	0·6	65	33
Dimwah	2,335	3,926	911	23·20	0·4	3,149	5,320	1,514	28·46	0·5	25	...
Heranwah	945	1,569	195	12·43	0·2	2,500	4,289	429	10·00	0·2	3	...
Hyderabad Canals. — Mehrabwah	12,505	22,829	11,187	49·00	0·9	14,188	26,353	20,596	78·15	1·5	59	...
Nasrat	18,132	42,274	19,941	47·17	1·10	23,296	53,882	16,125	29·93	0·7	66	...
Naolakhi	49,543	1,04,351	29,018	27·80	0·6	53,686	1,16,191	32,350	27·84	0·6	137	...
Dámbro	7,156	14,347	9,497	66·19	1·3	8,523	17,220	11,591	67·31	1·4	56	...
Dad	25,604	43,853	17,955	40·94	0·7	30,711	56,441	32,328	57·28	1·0	105	...
Ren	17,281	33,042	15,836	47·93	0·9	13,949	26,718	36,563	136·84	2·6	134	...
Alibhar Kacheri	7,484	13,408	6,489	48·40	0·9	6,853	12,860	14,788	114·99	2·2	56	...
Márak	42,001	82,451	16,732	20·29	0·4	46,660	92,709	20,685	22·31	0·4	194	1
Gharo Mahmuda	59,287	95,331	34,153	35·83	0·6	61,527	1,02,177	46,669	45·67	0·8	291	...
Kari Shumali	36,592	41,745	15,976	38·27	0·4	43,421	51,273	24,073	46·95	0·6	214	...
Nasir	27,490	45,808	17,868	39·00	0·6	30,552	50,698	25,662	50·62	0·8	130	...
Sarfraz	23,712	29,443	12,879	43·74	0·5	24,679	37,116	18,073	48·69	0·7	116	...
Other Canals	26,013	51,835	19,161	36·96	0·7	24,652	49,645	24,566	49·48	1·0	112	...
Fuleli Canals. — Fuleli	2,49,890	4,50,944	2,06,336	45·76	0·8	2,38,584	5,38,945	2,57,967	47·87	0·9	998	...
Other Canals	16,138	38,334	26,809	69·94	1·7	18,831	43,934	23,096	52·57	1·2	153	8
Karáchi Canals. — Nára	74,432	1,56,290	37,676	24·10	0·5	64,212	1,27,807	25,648	20·07	0·4	112	...
Phitta	5,788	10,258	5,746	56·01	1·0	5,232	9,330	3,456	37·04	0·7	27	...
Canals north of Kotri	15,316	25,998	12,838	49·38	0·8	16,686	28,288	10,576	37·39	0·6	58	...
Kalri	8,554	19,912	13,663	68·62	1·6	11,074	23,220	14,341	61·76	1·3	136	...
Baghár	17,489	29,779	13,494	45·31	0·8	20,198	39,983	14,445	36·13	0·7	108	...
Uchita	10,570	25,506	2,723	10·68	0·3	10,335	19,773	2,448	12·38	0·2	44	...
Canals in Tatta, &c.	9,506	16,969	8,120	47·85	0·9	12,585	21,242	5,684	26·76	0·5	83	...
Shal Canals	2,995	7,366	4,643	63·03	1·6	3,021	6,494	1,708	26·30	0·6	18	...
Pinyári	61,705	1,49,642	67,737	45·27	1·1	66,928	1,71,930	38,514	22·40	0·6	328	...
Canals in Mirpur Batoro	10,225	24,847	13,580	54·65	1·3	13,898	32,579	5,495	16·86	0·4	81	...
Canals in Sujáwal	6,781	15,626	5,058	32·37	0·7	6,868	17,256	3,991	23·13	0·6	35	...
Satta	7,905	18,069	8,447	46·75	1·0	8,558	17,505	6,075	34·70	0·7	58	...
Canals in Jati	1,791	4,204	2,104	50·00	1·2	2,122	5,761	939	16·30	0·4	11	...
Khanta	5,341	10,411	7,722	74·17	1·4	4,632	11,416	3,922	34·35	0·8	59	...
Kokawari	12,584	25,396	6,705	26·40	0·5	8,211	20,500	3,636	17·73	0·4	100	...
Canals in Shahbandar	2,385	4,163	4,538	109·00	1·9	1,406	3,531	1,571	44·49	1·1	7	...
Bunds, left bank	979	823	57,715	...	...	...	259	23,504	...	...	...	65
Bunds, right bank	768	1,105	24,560	...	...	...	153	46,307	...	...	...	50
Begári Canals	2,81,204	4,53,131	1,85,659	40·97	0·7	3,61,670	6,41,543	2,12,066	33·06	0·6	428	48
Shikárpur Canals	1,29,820	3,13,655	1,64,417	52·42	1·3	1,43,422	3,60,910	1,16,525	32·29	0·8	338	90
Ghár Canals	3,80,694	10,43,887	2,94,516	28·21	0·8	4,45,374	12,27,209	2,93,772	23·94	0·7	784	114
Eastern Nára Canals	1,42,961	2,80,656	88,487	31·53	0·6	2,17,700	4,06,017	1,23,600	30·44	0·6	280	237
Hyderabad Canals	3,52,800	6,20,717	2,26,692	36·52	0·6	3,82,797	6,93,626	3,24,064	46·72	0·8	1,670	1
Fuleli Canals	2,66,028	4,89,278	2,33,145	47·65	0·9	3,07,415	5,82,879	2,81,063	48·22	0·9	1,151	8
Karáchi Canals	2,55,114	5,46,364	2,97,069	54·37	1·2	2,65,257	5,57,035	2,22,260	39·90	0·9	1,265	115
Total	18,08,621	37,47,688	14,89,985	39·76	0·8	21,18,635	44,69,219	15,73,350	35·20	0·7	5,916	613
							Agricultural Receipts	217				
								44,69,436				

Note—The figures of canal revenue include Hakaba and Miscellaneous Revenue, which are actual receipts; the difference is based on assessments.

GEO. LAMBERT, M. Inst. C.E.,
Superintending Engineer in Sind.

TABLE VI.

Direct and Indirect Receipts of Canal Revenue for 1888-89.

Canals and Executive Districts.	Water Share of Net Consolidated Revenue as in Table VII.	Deduct average before improvement.	Balance Irrigation Share due to Canals.	Direct Receipts —Hakába and Miscellaneous.	Difference of Assessment on Jághir Lands.	Total Direct and Indirect Receipts.
1	2	3	4	5	6	7
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals — Desert Canal	1,24,214	.....	1,24,214	70,366	35,505	2,30,085
Begári Canals — Unharwah	79,195	.....	79,195	44	.....	79,239
Begári Canals — Begári Canal	3,10,119	24,856	2,85,263	50,971	40,768	3,77,002
Begári Canals — Kashmor Bund	6,634	.....	6,634	.....	.....	6,634
Shikárpur Canals — Canals in Rohri	2,03,550	.....	2,03,550	3,151	12,661	2,19,362
Shikárpur Canals — Bunds in Rohri	.....	.....	.....	5	.....	5
Shikárpur Canals — Sind Canals	1,51,586	.....	1,51,586	1,948	4,853	1,58,387
Shikárpur Canals — Sukkur-Begári Bund	.....	.....	.....	670	24	694
Ghár Canals — Sukkur Canal	1,95,914	71,550	1,24,364	1,764	2,729	1,28,857
Ghár Canals — Ghár	5,86,184	1,16,832	4,69,352	5,748	22,241	4,97,341
Ghár Canals — Nára	4,02,556	.....	4,02,556	6,648	24,590	4,33,794
Ghár Canals — Wáhur	15,570	.....	15,570	12	.....	15,582
Ghár Canals — Marvi	10,406	.....	10,406	2,200	.....	12,606
Ghár Canals — Bunds, right bank	95	.....	95	112	63	270
Eastern Nára Canals — Nára Supply Channel	7,683	.....	7,683	5,147	4,167	16,997
Eastern Nára Canals — Eastern Nára	52,003	3,444	48,559	10,342	.....	58,901
Eastern Nára Canals — Mithrau	2,34,776	.....	2,34,776	936	.....	2,35,712
Eastern Nára Canals — Thar Canal	85,153	.....	85,153	368	4,469	89,990
Eastern Nára Canals — Dimwah	5,310	.....	5,310	10	.....	5,320
Eastern Nára Canals — Heranwah	4,289	.....	4,289	.....	.....	4,289
Hyderabad Canals — Mehrabwah	26,078	.....	26,078	275	505	26,858
Hyderabad Canals — Nasrat	53,202	.....	53,202	680	1,637	55,519
Hyderabad Canals — Naolakhi	1,14,691	.....	1,14,691	1,500	6,032	1,22,223
Hyderabad Canals — Dámbro	16,412	.....	16,412	808	2,373	19,593
Hyderabad Canals — Dad	52,464	.....	53,464	3,977	11,724	68,165
Hyderabad Canals — Ren	26,490	.....	26,490	228	244	26,962
Hyderabad Canals — Alibhar Kacheri	12,371	8,427	3,900	489	1,955	6,388
Hyderabad Canals — Márak	88,508	36,459	52,049	4,201	12,887	69,137
Hyderabad Canals — Gháro Mahmuda	97,091	.....	97,091	5,086	25,652	1,27,829
Hyderabad Canals — Kari Shumali	46,661	.....	46,661	4,955	12,460	64,076
Hyderabad Canals — Nasir	49,410	.....	49,410	1,288	5,550	56,248
Hyderabad Canals — Sarfraz	32,748	11,155	21,593	4,368	8,805	34,766
Hyderabad Canals — Other Canals	48,584	.....	48,584	1,061	3,769	53,414
Fuleli Canals — Fuleli Canal	5,03,261	1,30,284	3,72,977	35,684	1,24,100	5,32,761
Fuleli Canals — Other Canals	43,458	.....	43,458	476	2,264	46,198
Karáchi Canals — Nára	1,18,230	.....	1,18,230	9,577	12,644	2,40,451
Karáchi Canals — Phitta	9,043	.....	9,043	287	937	10,267
Karáchi Canals — Canals north of Kotri	28,089	.....	28,089	199	8,845	37,133
Karáchi Canals — Kalri	22,864	.....	22,864	256	831	23,951
Karáchi Canals — Baghár	38,715	.....	38,715	1,268	2,001	41,984
Karáchi Canals — Uchita	19,211	.....	19,211	562	.....	19,773
Karáchi Canals — Canals in Tata, &c.	19,839	.....	19,839	1,403	2,296	23,538
Karáchi Canals — Shal Canals	6,494	.....	6,494	.....	.....	6,494
Karáchi Canals — Pinyári	1,69,268	.....	1,69,268	2,662	4,614	1,76,544
Karáchi Canals — Canals in Mirpur Batoro	32,569	.....	32,569	10	.....	32,579
Karáchi Canals — Canals in Sujáwal	17,183	.....	17,183	73	616	17,872
Karáchi Canals — Satta	17,327	.....	17,327	178	867	18,372
Karáchi Canals — Canals in Jati	5,728	.....	5,728	41	724	6,493
Karáchi Canals — Khanta	11,325	.....	11,325	91	331	11,747
Karáchi Canals — Kokawari	19,776	.....	19,776	724	.....	20,500
Karáchi Canals — Canals in Shahbandar	3,370	.....	3,370	161	898	3,429
Karáchi Canals — Bunds, left bank	.....	.....	.....	259	306	865
Karáchi Canals — Bunds, right bank	.....	.....	.....	153	1,481	1,634
Begári Canals	5,20,162	24,856	4,95,306	1,21,381	76,273	6,92,960
Shikárpur Canals	3,55,136	.....	3,55,136	5,774	17,538	3,78,448
Ghár Canals	12,10,725	1,88,382	10,22,343	16,484	49,623	10,88,450
Eastern Nára Canals	3,89,214	3,444	3,85,770	16,803	8,636	4,11,209
Hyderabad Canals	6,64,710	56,041	6,08,669	28,916	93,593	7,31,178
Fuleli Canals	5,46,719	1,30,284	4,16,435	36,160	1,26,364	5,78,959
Karáchi Canals	5,39,031	.....	5,39,031	18,004	37,391	5,94,426
Total	42,25,697	4,03,007	38,22,690	2,43,522	4,09,418	44,75,630
Add—Agricultural Receipts				217	.....	217
Total				2,43,739	.....	44,75,847

NOTE.—The figures in this statement, with the exception of Hakaba and Miscellaneous Receipts, are based on assessments.

GEO. LAMBERT, M. Inst. C.E.,
Superintending Engineer in Sind.

TABLE VI-A.

Actual Direct and Indirect Receipts of Canal Revenue in 1888-89 as shown in General Revenue Accounts of Executive Districts prepared by the Examiner, Public Works Accounts.

Canals and Districts.	Water share of net consolidated revenue collected.	Deduct average before improvement.	Balance Irrigation share due to canals.	Direct Receipts, Hakaba and Miscellaneous.	Difference of assessment on Jághír lands.	Total Direct and Indirect Receipts.
1	2	3	4	5	6	7
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals — Desert Canal	1,22,557	.....	1,22,557	70,366	35,505	2,28,428
Begári Canals — Unharwah	77,941	.....	77,941	44	.....	77,985
Begári Canals — Begári Canal	3,05,479	24,856	2,80,623	50,971	40,768	3,72,362
Begári Canals — Kashmor Bund	6,634	.....	6,634	.....	.....	6,634
Shikárpur Canals — Canals in Rohri	2,03,518	.....	2,03,518	3,151	12,661	2,19,330
Shikárpur Canals — Bunds in Rohri	.....	.....	.....	5	.....	5
Shikárpur Canals — Sind Canal	1,51,498	.....	1,51,498	1,948	4,853	1,58,299
Shikárpur Canals — Sukkur-Begári Bund	.....	.....	.....	670	24	694
Ghár Canals — Sukkur Canal	1,96,184	71,550	1,24,634	1,764	2,729	1,29,127
Ghár Canals — Ghár	5,84,369	1,16,832	4,67,537	5,748	22,241	74,526
Ghár Canals — Nára	4,02,568	.....	4,02,568	6,648	24,590	4,33,806
Ghár Canals — Wáhur	15,570	.....	15,570	12	.....	15,582
Ghár Canals — Márvi	10,406	.....	10,406	2,200	.....	12,606
Ghár Canals — Bunds, right bank	95	.....	95	112	63	270
Eastern Nára Canals — Nára Supply Channel	7,683	.....	7,683	5,147	4,167	16,997
Eastern Nára Canals — Eastern Nára	52,029	3,444	48,585	10,342	.....	58,927
Eastern Nára Canals — Mithrau Canal	2,34,409	.....	2,34,409	936	.....	2,35,345
Eastern Nára Canals — Thar Canal	85,256	.....	85,256	368	4,469	90,093
Eastern Nára Canals — Dimwah	5,311	.....	5,311	10	.....	5,321
Eastern Nára Canals — Heranwah	4,289	.....	4,289	.....	.....	4,289
Hyderabad Canals — Mehrabwah	26,078	.....	26,078	275	505	26,858
Hyderabad Canals — Nasrat	53,202	.....	53,202	680	1,637	55,519
Hyderabad Canals — Naolakhi	1,14,691	.....	1,14,691	1,500	6,032	1,22,223
Hyderabad Canals — Dambro	16,412	.....	16,412	808	2,373	19,593
Hyderabad Canals — Dad	52,464	.....	52,464	3,977	11,724	68,165
Hyderabad Canals — Ren	26,490	.....	26,490	228	244	26,962
Hyderabad Canals — Alibhar Kacheri	12,371	8,427	3,944	489	1,955	6,388
Hyderabad Canals — Marak	88,508	36,459	52,049	4,201	12,887	69,137
Hyderabad Canals — Gháro Mahmuda	97,091	.....	97,091	5,086	25,652	1,27,829
Hyderabad Canals — Kari Shumali	46,691	.....	46,691	4,955	12,460	64,106
Hyderabad Canals — Nasir	49,441	.....	49,441	1,288	5,550	56,279
Hyderabad Canals — Sarfraz	32,748	11,155	21,593	4,368	8,805	34,766
Hyderabad Canals — Other Canals	48,584	.....	48,584	1,061	3,769	53,414
Fuleli Canals — Fuleli	5,06,605	1,30,284	3,76,321	35,684	1,24,100	5,36,105
Fuleli Canals — Other Canals	43,752	.....	43,752	476	2,264	46,492
Karáchi Canals — Nára	1,16,644	.....	1,16,644	9,577	12,644	1,38,865
Karáchi Canals — Phitta	9,040	.....	9,040	287	937	10,264
Karáchi Canals — Canals north of Kotri	28,318	.....	28,318	199	8,845	37,362
Karáchi Canals — Kalri	21,682	.....	21,682	256	831	22,769
Karáchi Canals — Baghar	36,002	.....	36,002	1,268	2,001	39,271
Karáchi Canals — Uchita	21,070	.....	21,070	562	.....	21,632
Karáchi Canals — Canals in Tatta, &c.	18,577	.....	18,577	1,403	2,296	22,276
Karáchi Canals — Shal Canals	5,902	.....	5,902	.....	.....	5,902
Karáchi Canals — Pinyári	1,69,872	.....	1,69,872	2,662	4,614	1,77,148
Karáchi Canals — Canals in Mirpur Batoro	32,004	.....	32,004	10	.....	32,014
Karáchi Canals — Canals in Sujáwal	17,183	.....	17,183	73	616	17,892
Karáchi Canals — Satta	18,500	.....	18,500	178	867	19,545
Karáchi Canals — Canals in Jati	4,633	.....	4,633	41	724	5,398
Karáchi Canals — Khanta	11,794	.....	11,794	91	331	12,216
Karáchi Canals — Kokawari	19,534	.....	19,534	724	.....	20,258
Karáchi Canals — Canals in Sháhbandar	3,535	.....	3,535	161	898	4,594
Karáchi Canals — Bunds, left bank	.....	.....	.....	259	306	565
Karáchi Canals — Bunds, right bank	.....	.....	.....	153	1,481	1,634
Begári Canals	5,12,611	24,856	4,87,755	1,21,381	76,273	6,85,409
Shikárpur Canals	3,55,016	.....	3,55,016	5,774	17,538	3,78,328
Ghár Canals	12,09,192	1,88,382	10,20,810	16,484	49,623	10,86,917
Eastern Nára Canals	3,88,977	3,444	3,85,533	16,803	8,636	4,10,972
Hyderabad Canals	6,64,771	56,041	6,08,730	28,916	93,593	7,31,239
Fuleli Canals	5,50,357	1,30,284	4,20,073	36,160	1,26,364	5,82,597
Karáchi Canals	5,34,290	.....	5,34,290	18,004	37,391	5,89,685
Total	42,15,214	4,03,007	38,12,207	2,43,522	4,09,418	44,65,147
Add—Agricultural Receipts				217	.....	217
Total				2,43,739	.....	44,65,364

Note.—The figures in this statement are based on actual realizations.

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE VII.

Area of Cultivation and Consolidated Revenue for 1888-89.

Canals and Districts.	Cultivation.			Consolidated Revenue.			Remissions.			Net Consolidated Revenue.	Land Share, 10 per cent.	Water Share, 90 per cent.
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.			
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begá'ri Canals.												
Desert Canal	62,584	6,591	69,175	1,25,321	12,695	1,38,016	...	...	...	1,38,016	13,802	1,24,214
Unharwah	38,335	4,837	43,172	77,702	10,292	87,994	...	...	...	87,994	8,799	79,195
Begári Canal	147,494	15,770	163,264	3,22,195	38,498	3,60,693	1,533	14,583	16,116	3,44,577	34,458	3,10,119
Kashmor Bund... ...	1,314	2,311	3,625	2,685	4,686	7,371	...	...	...	7,371	737	6,634
Shikárpur Canals.												
Canals in Rohri ...	61,119	20,959	82,078	1,64,540	61,799	2,26,339	174	...	174	2,26,165	22,615	2,03,550
Bunds in Rohri ...	...	...	...	...	...	...	...	...	...	...	...	...
Sind Canal	49,833	5,222	55,055	1,50,763	17,666	1,68,429	...	...	...	1,68,429	16,843	1,51,586
Sukkur-Begári Bund ...	...	...	...	...	...	..	...	...	...	..	...	...
Ghár Canals.												
Sukkur Canal	63,322	19,351	82,673	1,60,575	57,800	2,18,375	484	209	693	2,17,682	21,768	1,95,914
Ghár	177,213	27,175	204,388	5,67,107	87,080	6,54,187	2,871	...	2,871	6,51,316	65,132	5,86,184
Nára	116,323	14,845	131,168	4,03,713	49,542	4,53,255	5,698	273	5,971	4,47,284	44,728	4,02,556
Wáhur	5,505	661	6,166	15,438	1,862	17,300	...	...	...	17,300	1,730	15,570
Marvi	3,106	996	4,102	8,079	3,484	11,563	...	...	...	11,563	1,157	10,406
Bunds, right bank ...	29	26	55	61	44	105	...	...	...	105	10	95
Eastern Nára Canals.												
Nára Supply Channel...	926	2,112	3,038	2,890	5,647	8,537	...	...	...	8,537	854	7,683
Eastern Nára	29,514	8,793	38,307	43,197	14,584	57,781	...	...	...	57,781	5,778	52,003
Mithrau Canal	94,043	27,796	121,839	2,10,595	51,141	2,61,736	874	...	874	2,60,862	26,086	2,34,776
Thar Canal	33,521	11,346	44,867	76,878	17,736	94,614	...	...	...	94,614	9,461	85,153
Dimwah	3,076	73	3,149	5,809	91	5,900	...	...	...	5,900	590	5,310
Heranwah	2,446	54	2,500	4,649	116	4,765	...	...	...	4,765	476	4,289
Hyderabad Canals.												
Mehrabwah	13,110	990	14,100	28,661	315	28,976	...	...	...	28,976	2,898	26,078
Nasrat	20,378	2,260	22,638	53,837	5,276	59,113	..	.	...	59,113	5,911	53,202
Naolakhi...	47,170	3,888	51,058	1,19,232	8,234	1,27,466	31	...	31	1,27,435	12,744	1,14,691
Dambro	6,932	517	7,449	17,591	645	18,236	..	...	...	18,236	1,824	16,412
Dad	23,543	1,382	24,925	54,558	3,745	58,303	10	...	10	58,293	5,829	52,464
Ren	13,487	356	13,843	29,562	990	30,552	1,119	...	1,119	29,433	2,943	26,490
Alibhar Kacheri ...	5,886	72	5,958	13,713	32	13,745	...	...	...	13,745	1,374	12,371
Márak	40,226	518	40,744	97,407	935	98,342	...	...	...	98,342	9,834	88,508
Gharo Mahmuda ...	46,689	2,249	48,938	1,03,915	4,295	1,08,210	331	...	331	1,07,879	10,788	97,091
Kari Shumali	33,694	722	34,416	50,914	1,636	52,550	704	...	704	51,846	5,185	46,661
Nasir	27,072	798	27,870	53,930	1,751	55,681	781	...	781	54,900	5,490	49,410
Sarfraz	19,050	480	19,530	34,518	1,991	36,509	122	...	122	36,387	3,639	32,748
Other Canals	20,168	2,733	22,901	48,439	6,254	54,693	699	12	711	53,982	5,398	48,584
Fuleli Canals.												
Fuleli	208,718	25,859	234,577	5,09,853	50,301	5,60,154	845	131	976	5,59,178	55,917	5,03,261
Other Canals	17,102	815	17,917	45,794	2,493	48,287	...	...	...	48,287	4,829	43,458
Karáchi Canals.												
Nára	39,971	16,095	56,066	1,03,173	41,046	1,44,219	12,844	9	12,853	1,31,366	13,136	1,18,230
Phitta	4,319	396	4,715	9,227	827	10,054	6	...	6	10,048	1,005	9,043
Canals north of Kotri ...	12,919	1,491	14,410	2-,094	3,227	31,321	111	...	111	31,210	3,121	28,089
Kalri ... ..., ...	9,760	900	10,660	24,543	2,886	27,429	2,024	...	2,024	25,405	2,541	22,864
Baghár	16,856	2,011	18,867	40,931	5,510	46,441	3,424	...	3,424	43,017	4,302	38,715
Uchita	9,819	516	10,335	22,278	1,316	23,594	2,249	...	2,249	21,345	2,134	19,211
Canals in Tatta, &c. ...	10,687	687	11,374	24,939	1,976	26,915	4,872	...	4,872	22,043	2,204	19,839
Shal Canals	2,548	473	3,021	7,235	1,212	8,447	1,231	...	1,231	7,216	722	6,494
Pinyári	64,652	2,276	66,928	1,82,910	6,675	1,89,585	1,510	..	1,510	1,88,075	18,807	1,69,268
Canals in Mirpur Batoro..	13,115	783	13,898	37,323	1,977	39,300	3,112	...	3,112	36,188	3,619	32,569
Canals in Sujáwal ..	6,519	349	6,868	18,142	1,119	19,261	169	...	169	19,092	1,909	17,183
Satta	8,343	215	8,568	18,702	550	19,252	...	...	..	19,252	1,925	17,327
Canals in Jati	2,108	14	2,122	6,274	91	6,365	...	...	...	6,365	637	5,728
Khanta	4,539	93	4,632	12,258	325	12,583	...	...	...	12,583	1,258	11,325
Kokawari	8,109	102	8,211	21,655	318	21,973	...	...	..	21,973	2,197	19,776
Canals in Shahbandar ...	1,394	12	1,406	3,689	56	3,745	...	...\	...	3,745	375	3,370
Bunds, left bank ...	...	...	...	...	...	...	...	...	...	..	..)	...
Bunds, right bank ...	...	...	...	...	...	...	...	...	...	...	...	...
Begári Canals	249,727	29,509	279,236	5,27,903	66,171	5,94,074	1,533	14,583	16,116	5,77,958	57,796	5,20,162
Shikárpur Canals	110,952	26,181	137,133	3,15,303	79,465	3,94,768	174	...	174	3,94,594	39,458	3,55,136
Ghár Canals	365,498	63,054	428,552	11,54,973	1,99,812	13,54,785	9,053	482	9,535	13,45,250	1,34,525	12,10,725
Eastern Nára Canals	163,526	50,174	213,700	3,44,018	89,315	4,33,333	874	...	874	4,32,459	43,245	3,89,214
Hyderabad Canals	317,405	16,965	334,370	7,06,277	36,099	7,42,376	3,797	12	3,809	7,38,567	73,857	6,64,710
Fuleli Canals	225,820	26,674	252,494	5,55,647	52,794	6,08,441	845	131	976	6,07,465	60,746	5,46,719
Karáchi Canals	215,658	26,413	242,071	5,61,373	69,111	6,30,484	31,552	9	31,561	5,98,923	59,892	5,39,031
Total	1,648,586	238,970	1,887,556	41,65,494	5,92,767	47,58,261	47,828	15,217	63,045	46,95,216	4,69,519	42,25,697

NOTE—The figures in this statement are based on assessments.

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE VII A.

Comparative Statement showing increases or decreases under heads Kharif and Rabi and Irrigation Share of Net Consolidated Assessments for 1887-88 and 1888-89.

Names of Canals.	1887-88.			1888-89.			Results.		
	Cultivation.		Irrigation share of net consolidated assessment.	Cultivation.		Irrigation share of net consolidated assessment.	Cultivation.		Irrigation share of net consolidated assessment.
	Kharif.	Rabi.		Kharif.	Rabi.		Kharif.	Rabi.	
Begári Canals.. Desert Canal	47,059	3,048	89,722	62,584	6,591	1,24,214	+15,525	+3,543	+34,492
Unharwah	27,504	1,902	53,155	38,335	4,837	79,195	+10,831	+2,935	+26,040
Begári Canal	1,20,472	5,765	2,30,789	1,47,494	15,770	3,10,119	+27,022	+10,005	+79,330
Kashmor..	1,132	2,708	6,958	1,314	2,311	6,634	+182	-397	-324
Shikárpur Canals. Canals in Rohri... ...	52,979	23,655	1,88,096	61,119	20,959	2,03,550	+8,140	-2,696	+15,454
Bunds in Rohri... ...	...	...	...	...	...	...	...	...	...
Sind Canal	44,481	4,431	1,34,377	49,833	5,222	1,51,586	+5,352	+791	+17,209
Sukkur Begári Bund ...	...	...	...	...	...	...	...	...	...
Ghár Canals ... Sukkur Canal	55,188	15,533	1,68,122	63,322	19,351	1,95,914	+8,134	+3,818	+27,792
Ghár do.	1,48,768	14,192	4,56,605	1,77,213	27,175	5,86,184	+28,445	+12,983	+1,29,579
Nára do.	1,04,712	22,296	3,80,867	1,16,323	14,845	4,02,556	+11,611	-7,451	+21,689
Wáhur do, ...	5,386	1,133	15,847	5,505	661	15,570	+119	-472	-277
Marvi do.	2,579	1,110	9,503	3,106	996	10,406	+527	-114	+903
Bunds, right bank ...	63	50	175	29	26	95	-34	-24	-80
Eastern Nára... Nára Supply Channel ...	564	1,898	6,238	926	2,112	7,683	+362	+214	+1,445
Eastern Nára Canal ...	16,626	8,134	34,837	29,514	8,793	52,003	+12,888	+659	+17,166
Mithrau Canal	83,076	21,916	2,05,587	94,043	27,796	2,34,776	+10,967	+5,880	+29,189
Thar Canal	24,010	7,775	62,352	33,521	11,346	85,153	+9,511	+3,571	+22,801
Dimwah	2,475	96	4,159	3,076	73	5,310	+601	-23	+1,151
Heranwah	1,446	129	2,629	2,446	54	4,289	+1,000	-75	+1,660
Hyderabad Canals. Mehrabwah	12,401	331	23,181	13,110	990	26,078	+709	+659	+2,897
Nasrat	16,205	2,562	44,760	20,378	2,260	53,202	+4,173	-302	+8,442
Naolakhi	44,627	4,226	1,07,778	47,170	3,888	1,14,691	+2,543	-338	+6,913
Dambro	6,459	669	15,172	6,932	517	16,412	+473	-152	+1,240
Dad	21,064	1,587	45,819	23,543	1,382	52,464	+2,479	-205	+6,645
Ren	14,370	628	29,335	13,487	356	26,490	-883	-272	-2,845
Alibhar Kacheri. ...	5,642	87	12,206	5,886	72	12,371	+244	-15	+165
Márak	35,260	448	78,685	40,226	518	88,508	+4,966	+70	+9,823
Gháro Mahmuda ...	42,327	2,696	91,282	46,689	2,249	97,091	+4,362	-447	+5,809
Kari Shumali	28,007	597	40,434	33,694	722	46,661	+5,687	+125	+6,227
Nasir	25,323	1,108	47,875	27,072	798	49,410	+1,749	-310	+1,535
Sarfraz	17,287	717	28,987	19,050	480	32,748	+1,763	-237	+3,761
Other Canals	19,551	3,525	48,333	20,168	2,733	48,584	+617	-792	+251
Fuleli Canals... Fuleli	1,94,611	25,929	4,88,618	2,08,718	25,859	5,03,261	+14,107	-70	+14,643
Other Canals	15,683	837	40,539	17,102	815	43,458	+1,419	-22	+2,919
Karáchi Canals Nára	36,289	19,668	1,28,451	39,971	16,095	1,18,230	+3,682	-3,573	-10,221
Phitta	3,703	1,579	10,130	4,319	396	9,043	+616	-1,183	-1,087
Canals north of Kotri ...	11,727	2,627	28,154	12,919	1,491	28,089	+1,192	-1,136	-65
Kalri	7,712	647	20,831	9,760	900	22,864	+2,048	+253	+2,033
Baghar	13,403	2,958	29,273	16,856	2,011	38,715	+3,453	-947	+9,442
Uchita	9,704	823	25,433	9,819	516	19,211	+115	-307	-6,222
Canals in Tatta, &c. ..	6,620	946	12,289	10,687	687	19,839	+4,067	-259	+7,550
Shal Canal	2,450	343	7,107	2,548	473	6,494	+98	+130	-613
Pinyári	63,691	2,112	1,59,341	64,652	2,276	1,69,268	+961	+164	+9,927
Canals in Mirpur Batoro	10,210	635	27,385	13,115	783	32,569	+2,905	+148	+5,184
Canals in Sujáwal ...	5,866	612	14,942	6,519	349	17,183	+653	-263	+2,241
Satta	9,149	130	18,438	8,343	215	17,327	-806	+85	-1,111
Canals in Jati	1,966	267	5,554	2,108	14	5,728	+142	-253	+174
Khanta	5,156	66	12,489	4,539	93	11,325	-617	+27	-1,164
Kokawari	11,805	245	24,052	8,109	102	19,776	-3,696	-143	-4,276
Canals in Shahbandar...	1,428	35	3,400	1,394	12	3,370	-34	-23	-30
Bunds, left bank ...	...	...	...	...	...	...	...	...	...
Bunds, right bank ...	...	...	...	...	...	...	...	...	...
Begári Canals	1,96,167	13,423	3,80,624	2,49,727	29,509	5,20,162	+53,560	+16,086	+1,39,538
Shikárpur Canals	97,460	28,086	3,22,473	1,10,952	26,181	3,55,136	+13,492	-1,905	+32,663
Ghár Canals	3,16,696	54,314	10,31,119	3,65,498	63,054	12,10,725	+48,802	+8,740	+1,79,606
Eastern Nára Canals	1,28,197	39,948	3,15,802	1,63,526	50,174	3,89,214	+35,329	+10,226	+73,412
Hyderabad Canals	2,88,523	19,181	6,13,847	3,17,405	16,965	6,64,710	+28,882	-2,216	+50,863
Fuleli Canals...	2,10,294	26,766	5,29,157	2,25,820	26,674	5,46,719	+15,526	-92	+17,562
Karáchi Canals	2,00,879	33,693	5,27,269	2,15,658	26,413	5,39,031	+14,779	-7,280	+11,762
Total ...	14,38,216	2,15,411	37,20,291	16,48,586	2,38,970	42,25,697	+2,10,370	+23,559	+5,05,406

Note.—The figures in this statement are based on assessments.

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE VII B.

Statement showing receipts from sale of occupancy rights in waste or other lands not belonging to the Irrigation Capital Account Works, but directly benefited by their construction, for the year 1888-89.

District.	Name of Irrigation Work.	Particulars of the Lands the Occupancy Rights of which were sold.				Amount of receipts from sale of occupancy rights.	Land Share 1/16	Irrigation Share 15/16	Sum to be credited as indirect revenue calculated at 4 per cent. on Irrigation Share.	Remarks.
		Taluka.	Village.	Area.	Assessment.					
				Acres.		Rs.	Rs.	Rs.	Rs.	
Upper Sind Frontier ..	Desert Canal	Too numerous to mention.	Too numerous to mention.	13,095	..	9,522	972	8,570	343	*This area is for that portion of the canal passing through the Shikárpur Collectorate. The Deputy Commissioner, Upper Sind Frontier, has not given the area of the canal sold in the Frontier Districts, but has given the amount only.
	Unharwah			8,043	..	5,846	585	5,261	210	
	Begári Canals			*3,096	..	31,524	3,152	28,372	1,135	
	Total ..			24,134	..	46,892	4,689	42,203	1,688	
Shikárpur	Sukkur Canal			583	..	5,667	567	5,100	204	
	Ghár Canal			325	..	3,291	329	2,962	118	
	Total ..			908	..	8,958	896	8,062	322	
Hyderabad	Mehrabwah			2,102	..	4,767	477	4,290	171	
	Total ..			2,102	..	4,767	477	4,290	171	
	Total for Sind ..			27,144	..	60,617	6,062	54,555	2,181	

Note.—The figures in this statement are based on actual realizations.

GEO. LAMBERT, M. Inst. C.E.,
Superintending Engineer in Sind.

TABLE VIII.

Discharges of certain Canals, Areas of Crops of different kinds irrigated, and Duty of Water per cubic foot of supply for Kharif Season, 1888.

Canals and Executive Charges.			Average Discharge per cubic foot per second.	Areas of Land Irrigated.				Area of Land Irrigated.		Total Area irrigated.	Area irrigated per cubic foot of supply.
				Jowári.	Bájri.	Rice.	Other crops.	By Lift.	By Flow.		
				Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
Upper Sind Frontier.	Begári Canals ..	Desert Canal .	1,971	67,146	5,292	74	27,735	10,760	89,638	100,217	53·58
		Muradwah ..	395	5,870	1,181	123	6,773	414	13,708	14,212	36·00
		Unharweh	1,059	22,037	2,957	158	18,797	4,170	39,049	43,209	40·80
		Begári Canal ..	4,040	102,377	5,537	7,789	89,950	35,852	170,001	205,853	50·95
Shikárpur Collectorate.	Shikárpur Canals ..	Sind Canal	1,431	22,959	307	21,523	6,619	11,817	39,591	51,408	35·92
	Ghar Canals.. ..	Sukkur Canal ..	1,779	20,381	458	24,454	18,099	10,958	53,064	(a) 63,322	35·86
		Ghár Canals	4,353	89,995	4,279	60,169	22,771	4,951	172,263	(b)177,214	42·32
Thar and Párkar ..	Eastern Nára ..	Mithrau	2,197	472	17,525	56,561	19,486	16,219	77,825	94,044	42·80
		Thar Canal	920	33	5,931	26,358	3,030	744	34,608	35,352	38·43
Hyderabad Collectorate.	Hyderabad Canals ..	Mehrabwah	412	8,020	2,884	27	2,035	12,151	1,115	13,266	32·20
		Nasrat	414	15,091	872	163	4,770	15,023	5,843	20,876	50·42
		Naolakhi	988	29,392	4,546	581	14,904	37,569	11,918	49,427	50·03
		Marak..	1,169	4,220	24,451	21	17,878	45,273	1,297	46,570	39·84
		Ghalu	607	2,245	24,184	..	15,411	42,559	81	42,640	70·25
		Nasir	385	947	19,882	55	8,892	29,621	65	29,686	77·11
		Sarfraz	743	508	10,985	14	6,550	23,501	556	24,057	47·36
	Fulell Canals ..	Fulell..	7,691	4,716	71,601	153,371	24,297	88,093	170,092	259,085	33·68
		Imamwah	2[illegible]	64	4,719	2,935	1,411	5,422	8,707	8,929	28·33
		Sanhi Guni	202	126	[illegible]	[illegible]	8	9	[illegible]	6,[illegible]	31·40
		Sherwah	100	61	[illegible]	[illegible]	2	7	2,88	2,[illegible]	2·07
		Aliwah	99	99	47	3,[illegible]	6,2	..	4,737	4,797	48·00

Note.—(a) Exclusive of 4·4 Jághir rea.
(b) do. 6,923 do..

A note to this effect will be attached for all districts in future.

GEO. LAMBERT, M. Inst. C.E.,
Superintending Engineer in Sind.

TABLE IX.

Rainfall in the Province of Sind for 1888-89.

Collectorates and Tálukas.			April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Total.
			In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.
Upper Sind Frontier.	Begári Canals.	Kashmor...	...	...	...	...	0 52	...	0 43	...	...	0 38	0 47	0 53	2 33
		Thul ...	...	...	...	0 25	0 62	...	...	...	...	0 36	0 68	0 9	2 0
		Jacobabad	...	...	...	0 57	0 15	...	...	...	...	0 41	0 70	0 15	1 98
		Shahdadpur	...	...	...	...	0 50	...	...	...	...	0 70	0 88	0 18	2 76
Shikárpur Collectorate.	Shikárpur Canals.	Ubauro ...	...	...	...	0 81	0 7	...	...	...	...	0 28	0 39	...	1 55
		Mirpur ...	...	...	0 14	0 58	0 15	...	...	...	...	...	0 12	...	0 99
		Ghotki ...	...	...	0 30	...	...	...	...	0 2	...	0 33	0 47	...	1 12
		Rohri ...	...	...	...	0 15	...	...	...	...	...	0 26	0 51	...	0 92
		Shikárpur	...	...	...	...	3 97	...	...	...	...	0 62	0 78	...	5 37
		Sukkur ...	...	...	...	...	...	...	...	...	...	0 31	0 63	...	0 94
		Garhi Yásin	...	...	...	...	3 6	...	...	...	...	0 58	1 40	0 8	5 12
	Ghár Canals.	Rato-dero ...	...	...	...	0 70	0 65	...	...	...	...	0 58	1 9	0 1	3 3
		Lárkhána ...	...	...	...	0 17	0 25	...	0 18	...	...	0 48	0 64	...	1 72
		Kambar ...	...	0 70	...	...	0 24	...	...	...	...	0 70	0 62	...	2 26
		Bákráni ...	...	...	...	0 10	...	...	...	...	...	0 30	0 69	...	1 9
		Mehrab ...	...	...	...	0 28	...	...	...	...	...	0 40	0 78	...	1 46
		Wárah ...	...	...	...	...	0 11	...	...	...	...	0 20	0 64	...	0 95
		Khairpur Náthe-shah ...	...	...	...	0 20	...	...	0 6	...	...	0 30	0 60	0 3	1 19
Thar and Párkar.	Easter Nára	Khipra ...	...	...	...	2 0	1 53	...	0 60	...	...	0 4	0 6	...	4 23
		Umarkot	...	...	...	0 70	3 27	...	...	...	...	0 7	...	...	3 94
		Mitti ...	...	...	...	3 26	1 78	...	...	0 25	...	...	...	0 84	6 13
		Nagar ...	...	...	0 11	6 90	9 75	...	...	0 11	...	...	0 2	...	16 89
Hyderabad Collectorate.	Hyderabad Canals.	Kandiáro ...	...	...	...	2 4	...	...	0 90	...	...	0 50	0 46	...	3 90
		Naushahro ...	...	...	...	1 15	0 10	...	0 40	...	...	0 14	0 15	...	1 94
		Tháru Shah ...	...	...	...	2 13	...	...	...	...	...	0 2	0 58	...	2 73
		Moro	...	...	...	...	0 40	...	...	...	...	...	0 90	...	1 30
		Sakrand	...	...	...	2 20	1 0	...	...	...	...	0 30	0 71	...	4 21
		Hála	...	...	...	3 30	1 20	...	...	0 5	...	0 6	0 52	0 20	5 33
		Shahdadpur ...	...	...	...	1 24	0 90	...	...	...	...	...	0 12	...	1 26
		Tando Adam ...	...	...	...	1 15	0 83	...	...	...	...	...	0 20	0 20	2 38
		Tando Alahyár...	...	...	0 16	2 60	2 25	...	...	0 27	...	...	...	...	5 28
		Mirpur Khás ...	...	...	...	1 24	1 97	...	0 8	...	...	...	0 4	0 5	3 38
	Fuleli Canals.	Hyderabad ...	...	...	...	2 90	3 90	...	...	...	...	...	0 9	0 40	7 29
		Dero Mohobat ...	...	...	...	4 10	4 73	...	...	...	...	...	...	...	8 83
		Tando Bágo ...	...	...	...	1 10	2 74	...	...	0 26	...	...	0 2	0 21	4 33
		Badin ...	...	...	...	1 59	3 57	...	...	0 5	...	...	0 3	0 40	4 64
		TandoMuhammad Khán ...	...	...	...	0 69	3 75	...	...	...	...	0 16	0 11	0 30	5 1
Karáchi Collectorate.	Karáchi Canals.	Dádú	0 13	...	...	0 32	...	...	...	...	...	...	1 21	0 14	1 80
		Johi	0 3	...	...	0 20	0 5	...	...	...	...	...	0 88	0 6	1 22
		Sehwan	...	...	...	0 5	0 92	...	...	0 5	...	0 35	1 10	...	2 47
		Mánjhand ...	...	...	...	0 40	0 40	...	...	...	...	0 10	0 62	0 14	1 66
		Kotri	...	...	...	2 34	2 15	...	...	...	...	0 3	0 10	0 62	5 24
		Bula Khán ...	...	...	...	1 70	...	...	...	...	...	0 47	0 28	0 29	2 74
		Jerruck	...	...	...	1 92	4 78	...	...	0 28	...	0 14	0 6	0 26	7 44
		Tatta	0 8	...	...	1 20	7 80	...	...	...	...	0 8	0 4	0 35	9 55
		Sákro	...	...	...	0 66	8 14	...	...	0 10	...	0 3	0 17	0 50	9 60
		Mirpur Batoro ...	...	...	...	2 1	8 25	...	...	...	...	...	0 5	0 10	10 41
		Sujáwal	...	...	...	1 75	7 50	...	...	0 11	...	0 3	0 19	0 49	10 7
		Shábbandar ...	...	...	...	2 1	6 50	...	...	0 3	...	0 19	0 5	0 50	9 28
		Kotri Ghorábári	...	...	...	1 26	4 81	...	...	0 10	...	...	0 3	0 50	6 79
		Keti	...	...	...	0 93	8 27	...	...	...	...	0 5	0 16	0 68	10 9
		Mugalbin ...	...	...	...	1 20	7 0	...	...	...	...	0 2	0 2	0 20	8 44
		Karáchi	...	...	...	0 14	0 71	...	...	0 18	...	1 24	0 8	0 20	2 55

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer in Sind.

Memorandum showing the amount of loss to Canals on account of difference between assessments of Water-rates on Jághir lands and the assessments at the ordinary rates in force for Government lands.

	To end of 1887-88.	During 1888-89.	To end of 1888-89.	Remarks.
	Rs.	Rs.	Rs.	
Major Works—Productive Works.				
Desert Canal	1,50,863	35,505	1,86,368	
Begári do.	2,48,293	39,121	2,87,414	
Eastern Nára Works	23,293	10,283	33,576	
Total ...	4,22,449	84,909	5,07,358	
Minor Works and Navigation—Works for which Capital and Revenue Accounts are kept.				
Sukkur Canal	19,714	2,729	22,443	
Ghar do.	97,305	22,241	1,19,546	
Mehrabwah	748	505	1,253	
Alibhar Kacheri Canal	18,736	1,955	20,691	
Marak Great do.	1,01,503	12,887	1,14,390	
Surfrazwah	46,971	8,805	55,776	
Fuleli Canal	8,64,217	1,24,100	9,88,317	
Total ...	11,49,194	1,73,222	13,22,416	
Works for which only Revenue Accounts are kept.				
Under Executive Engineer, Shikárpur Canals	...	17,538	...	
Do. Ghar do.	...	24,653	...	
Do. Hyderabad do.	...	69,441	...	
Do. Fuleli do.	...	2,264	...	
Do. Karáchi do.	...	37,391	...	
Total ...	...	1,51,287	...	

A. R. BECHER,
Examiner of Public Works Accounts.

STATEMENT No. I-B.

Capital Account of Irrigation Works in Sind for and to end of 1888-89.

Name of Work.	During the year.										To end of the year.									
	Direct Charges.						Indirect Charges.			Grand Total.	Direct Charges.						Indirect Charges.			Grand Total.
	Works.	Establishment.	Tools and Plant.	Total.	Deduct Receipts on Capital Account.	Total.	Capitalization.	Leave and Pension Allowances.	Total.		Works.	Establishment.	Tools and Plant.	Total.	Deduct Receipts on Capital Account.	Total.	Capitalization.	Leave and Pension Allowances.	Total.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MAJOR WORKS.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
PRODUCTIVE WORKS.																				
In Operation.																				
Desert Canal	31,371	6,275	...	37,646	...	37,646	...	878	878	38,524	9,80,739	2,19,445	14,280	12,14,464	37	12,14,427	...	40,447	40,447	12,54,874
Unharwah	173	35	...	208	...	208	...	5	5	213	2,79,267	52,087	481	3,31,835	...	3,31,835	...	7,293	7,293	3,39,128
Begári Canal	...	...	...	...	...	...	...	...	...	...	13,91,068	2,29,894	4,666	16,25,628	19	16,25,609	4,246	43,224	47,470	16,73,079
Eastern Nára Works ...	60,808	15,199	441	76,448	...	76,448	...	2,128	2,128	78,576	39,53,498	9,82,145	41,582	49,77,225	176	49,77,049	2,669	1,81,593	1,84,262	51,61,311
Total, Major Works ...	92,352	21,509	441	1,14,302	...	1,14,302	...	3,011	3,011	1,17,313	66,04,572	14,83,571	61,009	81,49,152	232	81,48,920	6,915	2,72,557	2,79,472	84,28,392
MINOR WORKS AND NAVIGATION.																				
Sukkur Canal	...	...	...	...	...	...	...	...	...	...	11,10,106	2,05,471	13,330	13,28,907	160	13,28,747	19,775	40,191	59,966	13,88,713
Khár Canal	...	...	...	...	...	...	...	...	...	...	3,38,237	75,554	1,746	4,15,537	...	4,15,537	10,329	15,111	25,440	4,40,977
Mehrabwah	...	...	...	...	...	...	...	...	...	...	52,797	13,199	22	66,018	...	66,018	...	1,851	1,851	67,869
Alibhar Kacheri Canal ...	...	...	...	...	...	...	...	...	...	...	19,636	3,548	23	23,207	...	23,207	...	710	710	23,917
Márak Great Canal ...	...	...	...	...	...	...	...	...	...	...	1,59,516	32,719	1,445	1,93,680	80	1,93,600	1,409	6,544	7,953	2,01,553
Surfrazwah	...	...	...	...	...	...	...	...	...	...	1,03,432	15,097	30	1,18,559	...	1,18,559	3,102	3,019	6,121	1,24,680
Fuleli Canal	47,000	9,400	...	56,400	...	56,400	4,737	1,316	6,053	62,453	8,18,688	1,67,314	651	9,86,653	21	9,86,632	6,401	32,895	39,296	10,25,928
Total, Minor Works and Navigation	47,000	9,400	...	56,400	...	56,400	4,737	1,316	6,053	62,453	26,02,412	5,12,902	17,247	31,32,561	261	31,32,300	41,016	1,00,321	1,41,337	32,73,637
Grand Total ...	1,39,352	30,909	441	1,70,702	...	1,70,702	4,737	4,327	9,064	1,79,766	92,06,984	19,96,473	78,256	1,12,81,713	493	1,12,81,220	47,931	3,72,878	4,20,809	1,17,02,029

A. R. BECHER,
Examiner of Public Works Accounts.

STATEMENT No. I-C.

Statement showing Financial Results of Irrigation Works in Sind for the year ending 31st March 1889.

Realizations under main heads of Revenue and Working Expenses.

Irrigation Works.	Revenue (actual Receipts).										Working Expenses.																	
	Irrigation.			Navigation.	Plantations.	Water-power.	Miscellaneous.	Total.	Refunds of Revenue.	Gross Revenue—Less Refunds.	Revenue Management.					Maintenance and Repairs.										Indirect Charges.	Grand Total, Working Expenses.	Net Revenue.
											Establishment.				Total Revenue Management.	Establishment.											
	Water-rate directly paid.	Share of Land Revenue.	Total.								Direction.	Executive.	Navigation.	Civil Officers.		Direction.	Executive.	Medical.	Total.	Works.	Repairs.	Sundries.	Tools and Plant.	Plantations.	Total Cost of Maintenance.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
	Rs.	Rs.	Rs.		Rs.		Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Major Works.																												
Productive Works.																												
Desert Canal	70,102	1,22,557	1,92,659	...	44	...	220	1,92,923	...	1,92,923	...	1,076	...	12,259	13,335	958	6,424	...	7,382	...	18,605	...	106	25	26,101	1,181	40,617	1,52,306
Unharwah	26	77,941	77,967	...	...	...	18	77,985	...	77,985	...	...	...	7,794	7,794	564	3,864	...	4,428	...	11,174	...	47	35	15,684	620	21,098	56,887
Begári Canal	50,491	2,80,623	3,31,117	...	13	...	464	3,31,594	...	3,31,594	...	1,076	...	28,391	29,467	2,255	15,053	...	17,308	...	45,303	...	100	16	64,447	2,662	93,576	2,37,018
Eastern Nára Works	980	3,87,953	3,88,919	...	1,534	...	14,283	4,02,336	...	4,02,336	630	9,255	...	29,669	39,554	1,729	25,420	...	27,149	...	46,300	...	6	591	74,046	5,185	1,28,785	2,73,551
Total, Major Works ...	1,21,609	8,68,654	9,88,262	...	1,591	...	14,985	10,04,838	...	10,04,838	630	11,407	...	82,113	1,00,150	5,516	51,361	...	56,877	...	1,21,475	...	259	667	1,79,278	9,648	2,89,076	7,15,762
Minor Works and Navigation.																												
Sukkur Canal	824	1,24,634	1,25,458	...	137	...	803	1,26,398	5	1,26,393	...	...	...	12,548	12,548	1,412	5,170	...	6,582	...	27,852	...	99	203	34,736	921	48,205	78,188
Ghar do.	2,094	4,01,737	4,03,831	...	897	...	2,757	4,73,285	13	4,73,272	...	...	...	47,137	47,137	6,939	25,207	...	32,146	67,279	70,558	...	208	216	1,70,707	7,807	2,25,141	2,48,131
Mehrabwah	6	26,052	26,058	...	39	...	230	26,327	...	26,327	...	...	...	2,608	2,608	772	1,821	...	2,593	...	15,344	...	46	...	17,983	863	20,954	5,369
Alibhai Kacheri Canal	450	3,914	4,364	...	30	...	...	4,43	...	4,43	...	...	...	440	440	616	1,353	...	2,069	...	12,242	...	87	..	14,348	280	15,078	—10,645
Marak Great do.	3,929	52,049	55,978	...	195	...	77	56,250	...	56,250	...	...	...	5,598	5,598	645	1,528	...	2,176	...	12,873	...	88	...	15,087	916	21,001	34,649
Surfarazwah	4,110	21,503	25,613	...	71	...	187	25,871	...	25,871	...	...	...	2,570	2,570	666	1,569	...	2,235	...	13,258	...	40	...	15,503	313	18,386	7,575
Fuleli Canal	31,055	3,76,321	4,07,376	...	2,271	...	2,358	4,12,005	...	4,12,005	...	...	...	40,788	40,788	9,344	21,698	...	31,042	...	1,86,431	...	—244	...	2,17,229	4,861	2,62,825	1,49,177
Total, Minor Works and Navigation	42,477	10,73,136	11,14,633	...	3,640	...	6,412	11,24,685	18	11,24,667	...	...	...	1,11,639	1,11,639	20,397	58,446	...	78,843	67,279	3,38,828	...	224	419	4,85,593	14,961	6,12,193	5,12,474
Grand Total ...	1,64,085	19,53,810	21,02,895	...	5,231	...	21,397	21,29,523	18	21,29,505	630	11,407	...	1,99,752	2,11,789	25,913	1,09,807	...	1,35,720	67,279	4,60,303	...	483	1,086	6,64,871	24,609	9,01,269	12,28,236

A. R. BECHER,
Examiner of Public Works Accounts.

STATEMENT No. II-C.

Statement showing Financial Results of Works in Sind for the year ended 1888-89 based on actual receipts—
Principal Results of operations for the year ended 31st March 1889.

Irrigation Works.	Direct and Indirect Capital outlay to end of 1888-89.	Gross Revenue, Direct and Indirect, from all sources.	Working Expenses, Direct and Indirect.	Net Revenue (excluding charges for Interest).	Interest at 4 per cent. on Direct Capital Outlay at commencement of year and at 2 per cent. on outlay during year.	Surplus Revenue after paying Interest on Direct Capital Outlay.		Excess charges including Interest on Direct Capital Outlay.	
						Amount.	Percentage on total sum at charge.	Amount.	Percentage on total sum at charge.
1	2	3	4	5	6	7	8	9	10
MAJOR WORKS.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
PRODUCTIVE WORKS.									
In Operation.									
Desert Canal	12,54,874	1,92,923	40,617	1,52,306	47,824	1,04,482	15·99	.....	.....
Unharwah	3,39,128	77,985	24,098	53,887	13,269	40,618	13·43	.....	.....
Begári Canal	16,73,079	3,31,594	95,576	2,36,018	65,024	1,70,994	23·52	.....	.....
Eastern Nára Works	51,61,311	4,02,336	1,28,785	2,73,551	1,97,553	75,998	1·26	.....	.....
Total, Major Works ...	84,28,392	10,04,838	2,89,076	7,15,762	3,23,670	3,92,092	5·09	.....	.....
MINOR WORKS AND NAVIGATION.									
Sukkur Canal	13,88,713	1,26,398	48,210	78,188	53,150	25,038	1·09	.....	.....
Ghár Canal	4,40,977	4,73,285	2,25,154	2,48,131	16,621	2,31,510	(a)	.....	.....
Mehrabwah	67,869	26,353	20,954	5,399	2,641	2,758	6·50	.....	.....
Alibhar Kacheri Canal	23,917	4,433	15,078	—10,645	928	.....	.....	11,573	33·12
Márak Great Canal	2,01,553	56,250	21,601	34,649	7,744	26,905	(a)	.....	.....
Surfrazwah	1,24 680	25,961	18,386	7,575	4,742	2,833	1·61	.....	.....
Fuleli Canal	10,25,928	4,12,005	2,62,828	1,49,177	38,337	1,10,840	22·26	.....	.....
Total, Minor Works ...	32,73,637	11,24,685	6,12,211	5,12,474	1,24,163	3,88,311	(a)	.....	.....
Grand Total ...	1,17,02,029	21,29,523	9,01,287	12,28,236	4,47,833	7,80,403	23·14	.....	.....

(a) The total sum at charge being minus, no percentage can be calculated.

A. R. BECHER,
Examiner of Public Works Accounts.

STATEMENT No. III-C.

Demands and Realizations during the year 1888-89 in Sind.

Irrigation Works.	Balance of demands unrealized at commencement of year.	Demands of the year.				Total, including Balance at commencement of year.	Deduct Remissions not involving cash outlay.	Net Total.	Deduct amount unrealized at close of the year.	Actual Receipts of the year.
		Rabi.	Kharif.	Miscellaneous.	Total.					
1	2	3	4	5	6	7	8	9	10	11
Major Works.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Works.										
Desert Canal	38,400	5,026	38,801	264	44,091	82,491	...	82,491	12,125	70,366
Unharwah...	.....	...	26	18	44	44	...	44	...	44
Begári Canal	29,636	5,265	30,426	477	36,168	65,804	...	65,804	14,833	50,971
Eastern Nára Works	613	551	1,205	15,817	17,573	18,186	...	18,186	1,383	16,803
Total, Major Works ...	68,649	10,842	70,458	16,576	97,876	1,66,525	...	1,66,525	28,341	1,38,184
Minor Works and Navigation.										
Sukkur Canal	434	253	261	940	1,454	1,888	...	1,888	124	1,764
Ghár Canal	263	17	2,186	3,654	5,857	6,120	...	6,120	372	5,748
Mehrabwah	.....	5	2	269	276	276	...	276	1	275
Alibhar Kacheri Canal	295	...	277	30	307	602	...	602	113	489
Márak Great Canal	1,941	5	1,898	272	2,175	4,116	...	4,116	—85	4,201
Surfrazwah	2,548	40	1,703	258	2,001	4,549	...	4,549	181	4,368
Fuleli Canal	9,656	917	23,452	4,629	28,998	38,654	...	38,654	2,970	35,684
Total, Minor Works and Navigation...	15,137	1,237	29,779	10,052	41,068	56,205	...	56,205	3,676	52,529
Grand Total ...	83,786	12,079	1,00,237	26,628	1,38,944	2,22,730	...	2,22,730	32,017	1,90,713

A. R. BECHER,
Examiner of Public Works Accounts.

STATEMENT No. IV-C.

Statement showing the Financial Results of Irrigation Works in Sind for the year 1888-89 based on assessment of the year.—Principal Results and Operations for the year ended 31st March 1889.

Irrigation Works.	Capital outlay, Direct and Indirect, to end of year.	Revenue assessed during the year.									Working Expenses, Direct and Indirect.	Net Assessed Revenue of the year.	Percentage on Capital Outlay to end of the year.
		Direct Assessed Revenue.							Indirect Revenue: land revenue due to operations of Canal.	Grand Total.			
		Occupier's rates.	Owner's rates.	Plantations.	Water power.	Navigation.	Miscellaneous.	Total.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14
MAJOR WORKS.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs	Rs.	
Productive Works.													
Desert Canal	12,54,874	43,827	...	44	...	...	220	44,091	1,24,214	1,68,305	40,617	1,27,688	10·18
Unharwah	3,39,128	26	...	...	...	...	18	44	79,195	79,239	24,098	55,141	16·26
Begári Canal	16,73,079	35,691	...	13	...	...	464	36,168	2,85,263	3,21,431	95,576	2,25,855	13·50
Eastern Nára Works	51,61,311	1,756	...	1,534	...	...	14,283	17,573	3,85,770	4,03,343	1,28,785	2,74,558	5·32
Total, Major Works ...	84,28,392	81,300	...	1,591	...	...	14,985	97,876	8,74,442	9,72,318	2,89,076	6,83,242	8·11
MINOR WORKS AND NAVIGATION.													
Sukkur Canal	13,88,713	514	...	137	...	...	803	1,454	1,24,364	1,25,818	48,210	77,608	5·59
Ghár Canal...	4,40,977	2,203	...	897	...	...	2,757	5,857	4,69,352	4,75,209	2,25,154	2,50,055	56·71
Mehrabwah...	67,869	7	...	39	...	...	230	276	26,078	26,354	20,954	5,400	7·96
Alibhár Kacheri Canal	23,917	277	...	30	...	...	...	307	3,944	4,251	15,078	—10,827	45·26
Marak Great Canal	2,01,553	1,903	...	195	...	...	77	2,175	52,049	54,224	21,601	32,623	16·19
Surfrazwah...	1,24,680	1,743	...	71	...	...	187	2,001	21,593	23,594	18,386	5,208	4·18
Fuleli Canal	10,25,928	24,369	...	2,271	...	...	2,358	28,998	3,72,977	4,01,975	2,62,828	1,39,147	13·56
Total, Minor Works ...	32,73,637	31,016	...	3,640	...	...	6,412	41,068	10,70,357	11,11,425	6,12,211	4,99,214	15·25
Grand Total ...	1,17,02,029	1,12,316	...	5,231	...	...	21,397	1,38,944	19,44,799	20,83,743	9,01,287	11,82,456	10·10

A. R. BECHER,
Examiner of Public Works Accounts.

STATEMENT.

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY.

General Abstract of Financial Results of Irrigation Works

WORKS IN

	Major Works—Productive Works.					Minor Works and Navigation—Works for which Capital				
	Desert Canal.	Unharwah.	Begári Canal.	Eastern Nára Works.	Total.	Sukkur Canal.	Ghár Canal.	Mehrabwah.	Alibhár Kacheri Canal.	Marak Great Canal.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Capital Outlay.										
During year ... Direct ...	37,646	208	...	76,448	1,14,302	...	.....	...	...	...
During year ... Indirect ...	878	5	...	2,128	3,011	...	.....	...	...	...
Total ...	38,524	213	...	78,576	1,17,313	...	.....	...	...	...
To end of year .. Direct ...	12,14,427	3,31,835	16,25,609	49,77,049	81,48,920	13,28,747	4,15,537	66,018	23,207	1,93,600
To end of year .. Indirect ...	40,447	7,293	47,470	1,84,262	2,79,472	59,966	25,440	1,851	710	7,953
Total ...	12,54,874	3,39,128	16,73,079	51,61,311	84,28,392	13,88,713	4,40,977	67,869	23,917	2,01,553
Gross Revenue.										
During year ... Direct ...	70,366	44	50,971	16,803	1,38,184	1,764	5,748	275	489	4,201
During year ... Indirect ...	1,22,557	77,941	2,80,623	3,85,533	8,66,654	1,24,634	4,67,537	26,078	3,944	52,049
Total ...	1,92,923	77,985	3,31,594	4,02,336	10,04,838	1,26,398	4,73,285	26,353	4,433	56,250
To end of year ... Direct ...	2,38,262	116	2,91,784	5,59,769	10,89,931	14,827	1,91,279	993	10,754	50,163
To end of year ... Indirect ...	14,69,976	1,96,070	37,81,026	47,06,183	1,01,53,255	9,52,861	1,14,54,416	1,29,241	93,902	7,49,276
Total ...	17,08,238	1,96,186	40,72,810	52,65,952	1,12,43,186	9,67,688	1,16,45,695	1,30,234	1,04,656	7,99,439
Working Expenses.										
During year ... Direct ...	39,436	23,478	92,914	1,23,600	2,79,428	47,289	2,17,857	20,591	14,788	20,685
During year ... Indirect ...	1,181	620	2,662	5,185	9,648	921	7,297	363	290	916
Total ...	40,617	24,098	95,576	1,28,785	2,89,076	48,210	2,25,154	20,954	15,078	21,601
To end of year ... Direct ...	4,77,710	65,561	18,84,440	24,51,699	48,79,410	8,37,280	33,33,651	83,662	1,09,598	2,72,606
To end of year ... Indirect ...	14,048	1,543	51,203	1,09,022	1,75,816	24,721	78,191	1,864	3,165	7,310
Total ...	4,91,758	67,104	19,35,643	25,60,721	50,55,226	8,62,001	34,11,842	85,526	1,12,763	2,79,916
Net Revenue.										
During year	1,52,306	53,887	2,36,018	2,73,551	7,15,762	78,188	2,48,131	5,399	—10,645	34,649
To end of year	12,16,480	1,29,082	21,37,167	27,05,231	61,87,960	1,05,687	82,33,853	44,708	—8,107	5,19,523
Simple Interest.										
During year	47,824	13,269	65,024	1,97,553	3,23,670	...	.....	...	...	...
To end of year...	5,10,447	51,752	10,20,169	34,86,518	50,68,886	...	.....	...	...	...
Net profit after paying off Interest.										
During year	1,04,482	40,618	1,70,994	75,998	3,92,092	...	.....	...	...	...
To end of year	7,06,033	77,330	11,16,998	—7,81,287	11,19,074	...	.....	...	...	...

NOTE.—Direct outlay under Working Expenses includes share of cost of
(a) Includes Rs. 5 less credited in 1887-88 now adjusted—*vide* Huzúr Deputy

in Sind for and up to the close of 1888-89.

OPERATION.											
AND REVENUE ACCOUNTS ARE KEPT:				MINOR WORKS AND NAVIGATION—WORKS FOR WHICH ONLY REVENUE ACCOUNTS ARE KEPT.						Expenditure on and Receipts from Agricultural Works for which neither Capital nor Revenue Accounts are kept.	
Surfraz-wah.	Fuleli Canal.	Total.	Grand Total.	Under Executive Engineer, Shikárpur Canals.	Under Executive Engineer, Ghár Canals.	Under Executive Engineer, Hyderabad Canals.	Under Executive Engineer, Fuleli Canals.	Under Executive Engineer, Karáchi Canals.	Total.		
										Expen-diture.	Re-ceipts.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
...	56,400	56,400	1,70,702	...	...	...	...	...	...		
...	6,053	6,053	9,064	...	...	...	...	...	...		
										BEGÁRI CANALS.	
...	62,453	62,453	1,79,766	...	...	...	...	...	...	*Kashmor Bund.*	
										Maintenance and repairs to the bund	39,736
1,18,559	9,86,632	31,32,300	1,12,81,220	...	...	...	...	...	...	Maintenance of garden at Badani	383
6,121	39,296	1,41,337	4,20,809	...	...	...	...	...	...	Rent of Telegraph line at Badani	1,800
										Maintenance and repairs of Buxaliwah	287
1,24,680	10,25,928	32,73,637	1,17,02,029	...	...	...	...	...	...	Clearing silt from Miraniwah and forming an escape channel	246
										Bund to protect the town of Khaira Ghari ...	1,442
4,368	35,684	52,529	1,90,713	5,774	8,972	19,583	476	18,004	52,809	Surveying a new canal in the Upper Sind Frontier.	1,561
21,593	3,76,321	10,72,156	19,38,810	3,55,016	4,28,639	5,05,066	43,752	5,34,290	18,66,763	General charges for Establishment and Tools and Plant	14,051
25,961	4,12,005	11,24,685	21,29,523	3,60,790	4,37,611	5,24,649	44,228	5,52,294	19,19,572	Share of collection charges in the Civil Department	663
31,641	5,70,614	8,70,271	19,60,202	...	...	...	...	...	...		
1,98,761	(a) 53,68,359	1,89,46,816	2,91,00,071	...	...	...	...	...	...		60,169	198
2,30,402	59,38,973	1,98,17,087	3,10,60,273	...	...	...	...	...	...	Irrigation share of Land Revenue	...	6,634
18,073	2,57,967	5,97,250	8,76,678	1,35,161	1,29,982	2,62,785	23,096	2,50,894	8,01,918			
313	4,861	14,961	24,609	...	...	...	...	...	...	Total, Begári Canals ...	60,169	6,832
18,386	2,62,828	6,12,211	9,01,287	1,35,161	1,29,982	2,62,785	23,096	2,50,894	8,01,918	SHIKÁRPUR CANALS.		
1,95,599	41,91,007	90,23,403	1,39,02,813	...	...	...	...	...	...	*Kasimpur Bund.*		
6,838	1,25,804	2,47,893	4,23,709	...	...	...	...	...	...	Maintenance and repairs to the bund	909	
2,02,437	43,16,811	92,71,296	1,43,26,522	...	...	...	...	...	...	General share of Establishment and Tools and Plant	416	
7,575	1,49,177	5,12,474	12,28,236	...	...	...	...	...	...	Total, Shikárpur Canals...	1,325	6
27,965	16,22,162	1,05,45,791	1,67,33,751	...	...	...	...	...	...			
										GHÁR CANALS	...	6
										EASTERN NÁRA DISTRICT.	...	7
...	...	...	...	...	...	...	...	...	...			
...	...	...	...	...	...	...	...	...	...	KARÁCHI CANALS.		
										Mathematical Instrument Depôt in Sind	2,269	...
...	...	...	...	...	...	...	...	...	...			
...	...	...	...	...	...	...	...	...	...	Total ...	63,763	6,851

(a) collection in the Civil Department.
Collector, Hyderabad's No. 236, dated 16th January 1889.

A. B. BECHER,
Examiner of Public Works Accounts.

BUKKUR GAUGE.

Series of readings for the year 1888.

Series of Mean readings for 10 years ending 1888.

Series of Mean readings for 4 years ending 1887.

Days.	June. Readings for 1888.	June. 10 years' M. ending 1888.	June. 4 years' M. ending 1887.	July. Readings for 1888.	July. 10 years' M. ending 1888.	July. 4 years' M. ending 1887.	August. Readings for 1888.	August. 10 years' M. ending 1888.	August. 4 years' M. ending 1887.	September. Readings for 1888.	September. 10 years' M. ending 1888.	September. 4 years' M. ending 1887.	Remarks.
	Ft. In.	Ft. In.	*Ft. In.*	Ft. In.	Ft. In.	*Ft. In.*	Ft. In.	Ft. In.	*Ft. In.*	Ft. In.	Ft. In.	*Ft. In.*	
1 ...	10 8	8 5	*8 10*	9 0	11 10	*11 9*	13 1	14 4	*15 2*	13 9	12 10	*13 7*	
2 ...	11 3	8 6	*8 10*	9 6	12 0	*11 8*	12 11	14 4	*15 3*	12 2	12 8	*13 6*	
3 ...	11 11	8 8	*8 9*	10 3	12 1	*11 7*	13 1	14 3	*15 2*	12 9	12 6	*13 1*	
4 ...	12 3	8 11	*9 0*	11 0	12 3	*11 7*	13 4	14 2	*14 11*	12 2	12 3	*12 7*	
5 ...	12 6	9 4	*9 2*	11 4	12 3	*11 6*	13 7	13 11	*14 4*	11 7	12 1	*12 1*	
6 ...	12 2	9 9	*9 11*	12 0	12 6	*11 10*	14 0	14 0	*14 2*	11 3	12 1	*11 11*	
7 ...	12 0	10 1	*10 1*	12 3	12 9	*12 2*	14 1	14 0	*14 0*	10 11	12 1	*12 0*	
8 ...	12 0	10 3	*10 1*	12 3	12 11	*12 5*	14 1	14 1	*14 0*	10 7	12 1	*12 1*	
9 ...	12 1	10 4	*9 10*	12 1	13 0	*12 10*	13 10	14 2	*14 1*	10 4	11 11	*12 0*	
10 ...	11 11	10 4	*9 7*	11 9	13 1	*13 2*	13 7	14 4	*14 3*	10 3	11 8	*11 11*	
11 ...	11 9	10 3	*9 5*	11 5	13 3	*13 6*	13 9	14 4	*14 5*	10 2	11 4	*11 5*	
12 ...	12 0	10 2	*9 4*	11 3	13 5	*13 11*	13 10	14 5	*14 7*	10 1	11 2	*11 2*	
13 ...	12 0	10 2	*9 4*	10 11	13 5	*14 1*	14 1	14 6	*14 10*	9 11	10 11	*10 11*	
14 ...	11 9	10 3	*9 4*	10 10	13 5	*13 11*	14 3	14 7	*15 0*	9 9	10 8	*10 9*	
15 ...	11 1	10 4	*9 6*	11 3	13 7	*13 9*	14 3	14 7	*15 0*	9 5	10 3	*10 2*	
16 ...	10 4	10 5	*9 8*	11 8	13 9	*13 9*	14 0	14 7	*15 2*	9 2	9 11	*9 8*	
17 ...	9 10	10 8	*10 0*	12 0	13 10	*13 9*	13 1	14 4	*14 11*	9 0	9 10	*9 2*	
18 ...	9 7	10 11	*10 5*	12 4	14 0	*14 0*	12 2	14 1	*14 9*	8 9	9 11	*8 10*	
19 ...	9 5	11 3	*10 10*	12 7	14 0	*14 0*	11 6	14 0	*14 9*	8 6	9 9	*8 8*	
20 ...	9 3	11 5	*10 10*	12 10	14 1	*14 1*	11 4	14 0	*14 10*	8 3	9 8	*8 8*	
21 ...	8 10	11 6	*11 1*	12 9	14 1	*14 0*	11 7	13 11	*14 9*	8 0	9 6	*8 8*	
22 ...	8 6	11 8	*11 3*	12 8	14 1	*14 2*	12 0	13 10	*14 9*	7 11	9 3	*8 6*	
23 ...	8 2	11 6	*11 4*	12 6	14 1	*14 3*	12 7	13 10	*14 10*	7 11	8 9	*8 3*	
24 ...	8 0	11 6	*11 5*	12 1	14 2	*14 5*	13 1	13 9	*14 10*	7 11	8 4	*7 8*	
25 ...	7 11	11 6	*11 7*	11 11	14 2	*14 6*	13 7	13 7	*14 6*	7 10	8 0	*7 3*	
26 ...	8 0	11 6	*11 10*	12 2	14 2	*14 6*	13 10	13 5	*14 2*	7 8	7 9	*7 0*	
27 ...	8 2	11 6	*11 11*	12 10	14 2	*14 6*	14 2	13 5	*14 2*	8 0	7 7	*7 1*	
28 ...	8 5	11 6	*11 11*	13 3	14 3	*14 8*	14 4	13 4	*14 1*	8 4	7 4	*6 10*	
29 ...	8 7	11 7	*11 11*	13 8	14 3	*14 9*	14 5	13 5	*14 2*	8 7	7 2	*6 8*	
30 ...	8 10	11 8	*11 10*	13 6	14 4	*14 11*	14 4	13 4	*14 1*	8 2	6 11	*6 6*	
31 ...	...	...	...	13 3	14 4	*15 1*	14 2	13 0	*13 8*	...	...	...	

Readings of the year 1888 shown in Roman.
Mean readings for 10 years ending 1888 shown in Block.
Mean readings for 4 years ending 1887 shown in Italics.
M. is marked for "mean."

KOTRI GAUGE.

Series of readings for the year 1888.

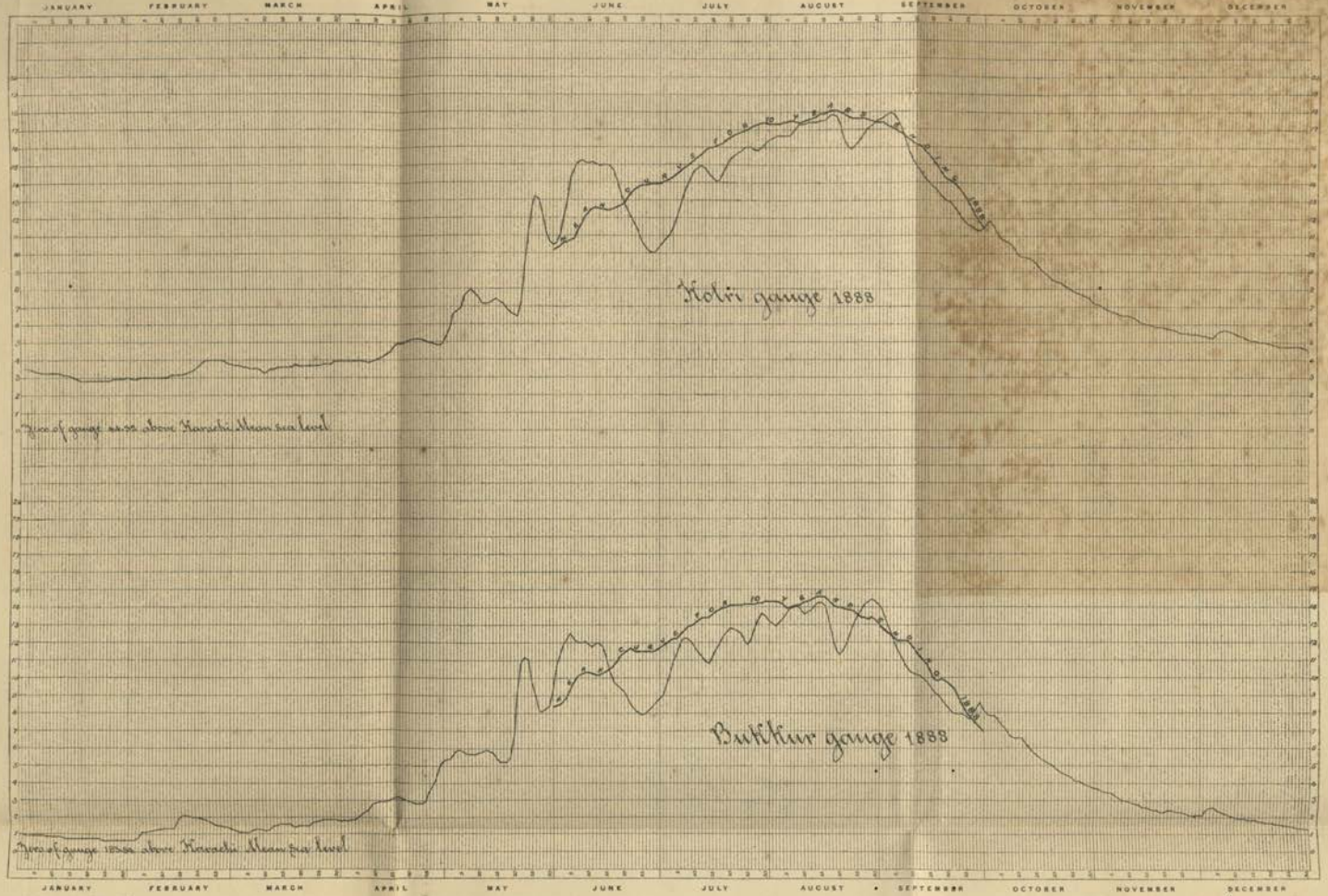
Series of Mean readings for 10 years ending 1888.

Series of Mean readings for 4 years ending 1887.

Days.	June. Readings for 1888.	June. 10 years' M. ending 1888.	June. 4 years' M. ending 1887.	July. Readings for 1888.	July. 10 years' M. ending 1888.	July. 4 years' M. ending 1887.	August. Readings for 1888.	August. 10 years' M. ending 1888.	August. 4 years' M. ending 1887.	September. Readings for 1888.	September. 10 years' M. ending 1888.	September. 4 years' M. ending 1887.	Remarks.
	Ft. In.	Ft. In.	*Ft. In.*	Ft. In.	Ft. In.	*Ft. In.*	Ft. In.	Ft. In.	*Ft. In.*	Ft. In.	Ft. In.	*Ft. In.*	
1 ...	10 7	10 3	*11 1*	10 7	14 0	*14 9*	16 6	17 4	*18 2*	17 9	17 5	*18 9*	
2 ...	11 1	10 5	*11 2*	10 10	14 1	*14 8*	16 8	17 4	*18 3*	17 10	17 3	*18 8*	
3 ...	12 2	10 8	*11 3*	11 1	14 2	*14 7*	16 8	17 4	*18 4*	17 11	17 2	*18 7*	
4 ...	13 3	10 8	*11 4*	11 6	14 4	*14 7*	16 8	17 5	*18 5*	17 10	17 1	*18 7*	
5 ...	14 4	10 9	*11 3*	12 0	14 6	*14 6*	16 8	17 5	*18 7*	17 6	16 11	*18 6*	
6 ...	14 10	10 10	*11 5*	12 8	14 8	*14 5*	16 8	17 6	*18 8*	17 0	16 10	*18 3*	
7 ...	15 2	11 3	*11 9*	13 4	14 10	*14 6*	17 0	17 6	*18 8*	16 5	16 8	*17 10*	
8 ...	15 4	11 8	*12 3*	13 10	14 11	*14 7*	17 3	17 5	*18 5*	15 10	16 6	*17 5*	
9 ...	15 2	12 1	*12 8*	14 4	15 1	*14 10*	17 4	17 5	*18 3*	15 4	16 4	*17 3*	
10 ...	15 1	12 4	*12 10*	14 8	15 3	*15 3*	17 4	17 6	*18 2*	15 0	16 2	*17 1*	
11 ...	15 2	12 6	*12 11*	14 10	15 5	*15 7*	17 5	17 7	*18 2*	14 9	16 2	*17 0*	
12 ...	15 0	12 7	*12 8*	14 11	15 7	*15 11*	17 5	17 8	*18 2*	14 5	16 0	*16 9*	
13 ...	14 11	12 6	*12 5*	14 9	15 10	*16 2*	17 5	17 9	*18 3*	14 2	15 9	*16 6*	
14 ...	15 0	12 6	*12 2*	14 6	16 0	*16 6*	17 6	17 11	*18 5*	14 0	15 6	*16 2*	
15 ...	15 0	12 5	*11 11*	14 3	16 0	*16 8*	17 6	17 11	*18 5*	13 9	15 3	*15 11*	
16 ...	14 11	12 5	*11 11*	14 1	16 1	*16 10*	17 7	18 0	*18 7*	13 7	15 0	*15 8*	
17 ...	14 8	12 6	*12 0*	14 2	16 2	*16 11*	17 10	18 1	*18 8*	13 4	14 8	*15 3*	
18 ...	14 0	12 7	*12 1*	14 6	16 3	*16 10*	17 10	18 1	*18 9*	13 2	14 5	*14 9*	
19 ...	13 3	12 8	*12 4*	15 0	16 5	*16 10*	17 9	18 1	*18 10*	13 0	14 3	*14 4*	
20 ...	12 10	12 11	*12 8*	15 4	16 7	*16 11*	17 3	18 0	*18 11*	12 11	14 2	*14 0*	
21 ...	12 5	13 2	*13 1*	15 6	16 8	*17 0*	16 6	17 10	*18 10*	12 8	14 0	*13 9*	
22 ...	12 0	13 5	*13 5*	15 8	16 9	*17 0*	16 1	17 9	*18 10*	12 5	13 10	*13 7*	
23 ...	11 7	13 7	*13 7*	15 9	16 10	*17 0*	15 11	17 8	*18 11*	12 2	13 7	*13 5*	
24 ...	11 2	13 9	*13 9*	16 0	16 11	*17 1*	16 1	17 8	*19 0*	11 11	13 5	*13 3*	
25 ...	10 8	13 10	*13 11*	16 0	17 0	*17 5*	16 4	17 8	*19 1*	11 8	13 1	*13 1*	
26 ...	10 5	13 10	*14 1*	16 0	17 2	*17 6*	16 7	17 8	*19 2*	11 7	12 9	*12 9*	
27 ...	10 2	13 11	*14 3*	15 10	17 3	*17 8*	16 11	17 8	*19 2*	11 5	12 4	*12 5*	
28 ...	10 0	13 11	*14 5*	15 10	17 4	*17 9*	17 1	17 7	*19 2*	11 4	12 0	*12 1*	
29 ...	10 1	13 11	*14 7*	16 0	17 5	*17 11*	17 3	17 6	*19 0*	11 4	11 8	*11 11*	
30 ...	10 4	13 11	*14 8*	16 3	17 5	*18 0*	17 6	17 5	*18 10*	11 6	11 6	*11 9*	
31 ...	...	...	...	16 5	17 4	*18 1*	17 7	17 5	*18 10*	...	...	...	

Readings of the year 1888 shown in Roman.
Mean readings for 10 years ending 1888 shown in Block.
Mean readings for 4 years ending 1887 shown in Italics.
M. is marked for "mean."

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer in Sind.

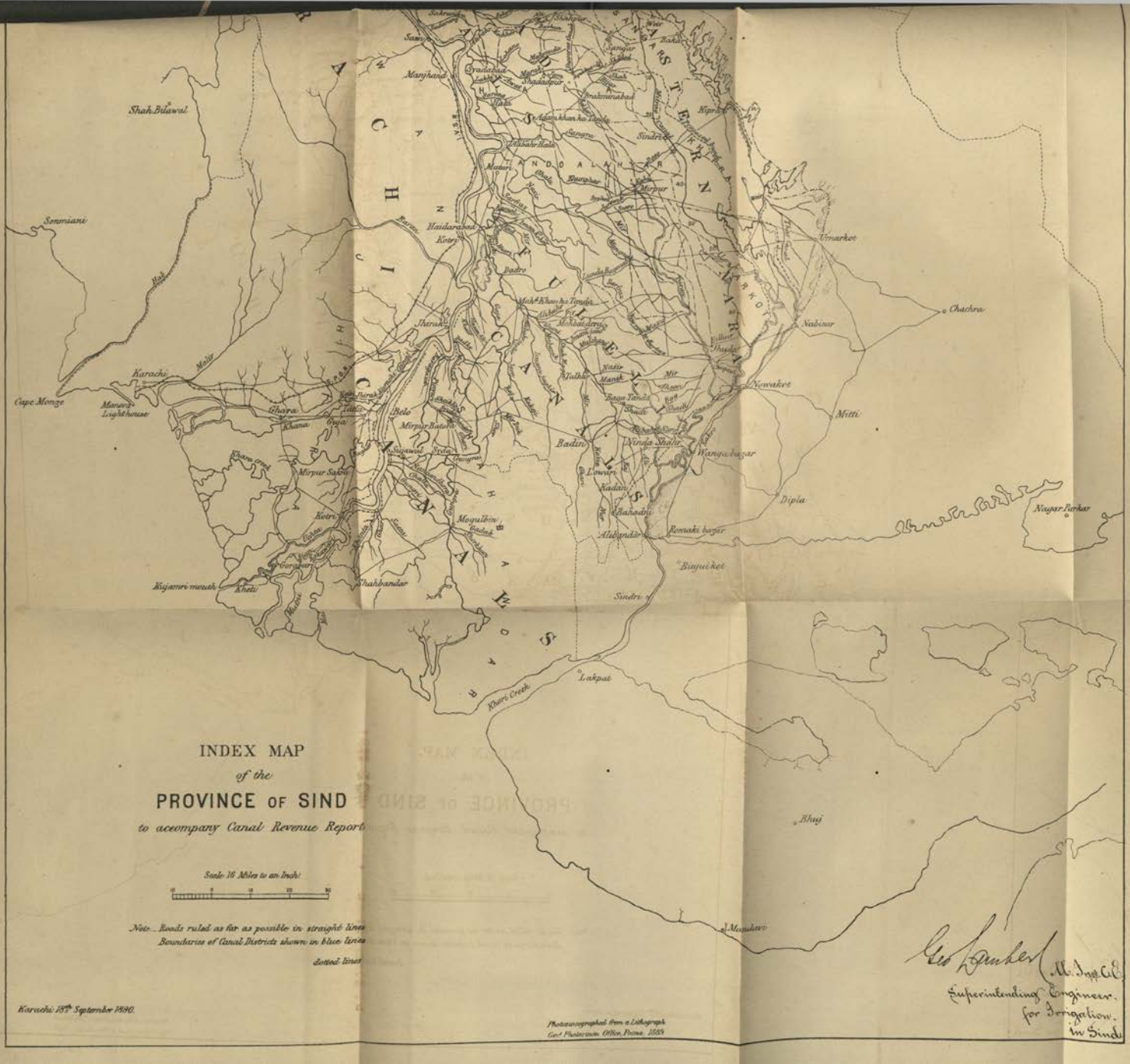


Govt Photozinco Office, Poona, 1889

Sectional Paper to register the rise and fall of rivers &c. Supplied by the Geographical Branch of the Public Works Department, India Office, London 1870.

Geo Lambert M. Inst C.E.
Superintending Engineer.
in Sind.

To Sibi
Tarnpie deori
Jhatpat
Jacobabad
Khairo Garhi
Garduka
Shikarpur
Shadanzai
Nasirabad
Ghaibi dera
Kambar
Kakar
Kashar
Pulji
Jaha
Chini
Ehan
Shah Hasan
Jhangara
Kazi Ahmad
Amri
Manjhand
Shah Bilawal
Sonmiani
Hab
Haidarabad
Kotri
Badra
Jherak
Sehwan
Baelatpur
Mora
Kandiaro
Nawabshah
Khairpur
Kot Diji
Jarruje
Kot Imamgarh
Yamben
Sakrand
Tando Adam
Tando Allahyar
Matiari
Hyderabad
Tando Ghulam Hyder
Umarkot
Nabisar
Chachra
Mirpur
Sindri
Kipro
Brahmanabad
Shahdadpur
Sangra
Bhangar
Bakar
Jangjar
Wan
Gaja
Khipro
Mirpur Khas
Jhuddo
Mehrabpur
Sanghar
Tando Jam
Tando Muhammad Khan
Tando Allahyar
Matiari
Hyderabad
Jherak
Badra
Kotri
Haidarabad
Manjhand
Sehwan
Kazi Ahmad
Shah Hasan
Chini
Ehan
Jaha
Kashar
Pulji
Garduka
Khairo Garhi
Jacobabad
Shikarpur
Nasirabad
Kambar
Ghaibi dera
Jarruje
Kot Diji
Khairpur
Nawabshah
Mora
Kandiaro
Tando Adam
Sakrand
Yamben
Amri
Lakki
Shangara
Baelatpur
Sehwan
Shah Hasan
Chini
Ehan
Jaha
Kashar
Pulji
Garduka
Khairo Garhi
Jacobabad
Shikarpur
Nasirabad
Kambar
Ghaibi dera
Jarruje
Kot Diji
Khairpur
Nawabshah
Mora
Kandiaro
Tando Adam
Sakrand
Yamben
Amri
Lakki
Shangara
Kazi Ahmad
Manjhand
Shah Bilawal
Sonmiani
Hab
Haidarabad
Kotri
Badra
Jherak
Tando Allahyar
Matiari
Hyderabad
Tando Ghulam Hyder
Umarkot
Nabisar
Chachra
Mirpur
Sindri
Kipro
Brahmanabad
Shahdadpur
Sangra
Bhangar
Bakar
Jangjar
Wan
Gaja
Khipro
Mirpur Khas
Jhuddo
Mehrabpur
Sanghar
Tando Jam
Tando Muhammad Khan
Tando Allahyar
Matiari
Hyderabad
Jherak
Badra
Kotri
Haidarabad
Manjhand
Sehwan
Kazi Ahmad


INDEX MAP
of the
PROVINCE OF SIND
to accompany Canal Revenue Report
Scale 16 Miles to an Inch
Note.- Roads ruled as far as possible in straight lines
Boundaries of Canal Districts shown in blue lines
dotted lines
Karachi 18th September 1880.
Photozincographed from a Lithograph
Govt Photozincon Office, Poona, 1889
Geo Lambert (M. Inst. C.E.)
Superintending Engineer.
for Irrigation.
in Sind.
Shah Bilawal
Sonmiani
Cape Monze
Manora Lighthouse
Karachi
Ghara
Khana
Gaja
Belo
Mirpur Batoro
Mirpur Sakra
Kotri
Gorabari
Kujamri mouth
Kheli
Shahbandar
Mogulbin
Sujawal
Jhirak
Haidarabad
Kotri
Dadro
Mahkhan ka Tanda
Mohbaldera
Talhar
Badin
Lowari
Kadan
Bahadri
Alibandar
Remaki bazar
Bujuiket
Sindri
Lakpat
Khori Creek
Nindu Shahr
Wanga bazar
Nowakot
Mitti
Dipla
Nagar Parkar
Nabisar
Chachra
Umarkot
Kipra
Sindri
Mirpur
Sangar
Shadadpur
Syadabad
Manjhand
Sasri
Sakrand
Shahpur
Bhuj
Mandavi
Sanghar
Mahmud
Shahbandar
Gorabari
Kotri
Mirpur Sakra
Khara creek
Sujawal
Jhirak
Mahbaldera
Mirpur
Sindri
Bhuj
Mandavi

List of highest readings on Bukkur and Kotri Gauges for 10 years from 1879 to 1888.

BUKKUR GAUGE.

1879.			1880.			1881.			1882.			1883.			1884.			1885.			1886.			1887.			1888.		
Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.
20th August ..	16	1	8th July ..	14	11	20th June ..	14	5	7th August ..	17	7	17th July ..	15	11	19th August ..	15	9	20th July ..	15	5	22nd July ..	16	3	18th August.	16	7	23th August.	14	5

KOTRI GAUGE.

1st September..	19	7	14th August ..	17	1	28th August ..	17	2	17th August ..	20	5½	26th July ..	18	9	27th August ..	19	2	4th September.	20	4	19th August ..	20	3	22nd August.	19	8	3rd Sept. ..	17	11

GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer in Sind.

No. 5358 of 1889.

PUBLIC WORKS DEPARTMENT.

FROM

THE SUPERINTENDING ENGINEER IN SIND,

To

THE SECRETARY TO GOVERNMENT,

PUBLIC WORKS DEPARTMENT,

Bombay.

Camp Sita, 22nd December 1889.

SIR,

I have the honour to submit my Irrigation Revenue Report for 1888-89 with the usual tables, charts, index map of Sind, and comparative statements showing averages of gauge readings of the past ten years ending 1888, and four years ending 1887.

2. The report is submitted two days later than the past year's and the delay is due to the following causes:—

(a) The general revenue accounts, general financial results and Statements I-B to IV-C were not received from the Examiner, Public Works Accounts, until the 5th of the current month.

(b) There were several discrepancies in canal returns VIII and VIII-A and IX submitted by some of the revenue officials, and these formed the subject of references to and fro, and were not cleared up until late in the current month, and one discrepancy in particular was not settled until the 18th idem, and then by telegraph communication.

3. All these references of course prevented the preparation of the tables of statistics, and until they were finally completed the report could not be closed and submitted.

4. I do not see that the Examiner, Public Works Accounts, is in any way to blame for not submitting the statements referred to earlier than he has; because the dates on which the canal returns are submitted to him by the Revenue officials does not permit of his doing so, and I am of opinion that an earlier date should be fixed for the submission of these returns. Unless these points are arranged for, I fear there will always be delay in submitting this report, and bearing in mind its importance the time allowed for its preparation is altogether too short.

I have the honour to be,
Sir,
Your most obedient Servant,
GEO. LAMBERT, M.Inst.C.E.,
Superintending Engineer in Sind.

No. 559 of 1890.

PUBLIC WORKS DEPARTMENT.

Commissioner's Office;
Camp Naushâhro, 14th February 1890.

Submitted to Government.

2. The report has been sent on by the Superintending Engineer two days later than in the previous year, and the principal reason assigned for the delay is that the figures of assessments and realizations were not forwarded to the Examiner by the Revenue authorities at a sufficiently early date. With regard to this question, reference is invited to the correspondence ending with the Commissioner's letters No. 1108 of the 30th March 1889 and No. 2629 of the 20th July 1889 to the address of the Govern-

Superintending Engineer's No. 5358, dated the 22nd December 1889.

ment of Bombay. The difficulty arises from the practice of incorporating in the revenue administration report a number of tables primarily designed to exhibit the financial position of the various irrigational works from the point of view of the Account Department, and of trying to frame these tables so as to illustrate at the same time the material results of the season's working. In the opinion of the Commissioner it would be better to keep these two aspects of the subject distinct; to base the financial review entirely and exclusively on actual collections and actual expenditure within the limits of the financial year as recorded in the treasury accounts, which would admit of its being furnished either separately or as part of the departmental administration report within two months of the close of the financial year, and to confine the revenue report to the results of the season's inundation in conjunction with the season's expenditure as affecting the season's revenue and the material condition of the province, with such notice as may be called for from a revenue point of view of works in progress or projected. A report of this kind would be based on the assessment, remissions and realizations of the revenue year, as contrasted with the expenditure following the inundation of the previous season, and would be sufficiently early if submitted by the date now customary. But absolute financial accuracy would scarcely be essential to the modified object it would serve, and if this were dispensed with, it might be submitted without difficulty a good deal earlier.

3. The inundation was the lowest known since 1881. The mean reading of the Bukkur gauge between the 1st June and the 10th September 1888 was 12′ 3″, while during the corresponding period in 1881 it was 12′ 1″. But the maximum height of the season, 14′ 5″ was reached in 1888 on the 29th August, while in 1881 the maximum, 14′ 3″, occurred on the 25th June. The late rise of the river between the 14th July and the 15th August, and again between the 20th and 29th August, was most beneficial, and to this and the generally good condition of the canals must be attributed the excellent results which have attended an inundation which was decidedly below the average. Although, however, the results of the season, judged from a revenue point of view, were excellent, the effect of the low inundation was very marked in many parts of the country, especially at the tails of the canals, where owing to the deficiency of the water-supply the yield of the crops was light. The injury done was in most cases not sufficient to justify the admission of claims to remissions, and consequently the revenue did not suffer to any great extent; but the harvests were not first-rate, and with such an inundation could not be expected to be so. The Superintending Engineer has judged the results of the season too exclusively from the amount of canal revenue realized and has omitted to notice the prejudicial effect of the low inundation upon the outturn of the crops.

4. The remarks made by the Superintending Engineer in paras. 3 and 4 of the report deserve careful consideration. It is not quite clear that it can safely be assumed at once that all large canals should be deepened so as to begin to flow when the river reaches a height of 5 feet at Bukkur. The Commissioner believes that in the lower reaches of the river it is often some days before the rise at Bukkur is fully felt, and the advisability of spending money in deepening canals to admit water, which would enter them in their present condition without any further rise at Bukkur a day or two later, seems questionable. But the collection of data as to the relative depth of water entering the various main canals with reference to a common standard based upon the Bukkur gauge readings is undoubtedly most desirable and likely to be of material assistance in the future regulation of bed levels and clearances. The statement made in para. 3 that "as long as the bunds are kept intact and the canals are kept in such order as will insure their working well with an average supply of water, there can never be a failure of crops or remissions of revenue required for want of water in Sind" also requires some qualification. The eccentricities of the river have to be taken into account and it sometimes happens that a canal put in perfect order before the inundation season will not work well owing to an unfavourable set in the river. But in the main Mr. Lambert's conclusion is undoubtedly correct and furnishes a strong argument in favour of well regulated and systematic canal clearances.

5. By the Government Resolution on last year's Revenue Administration Report, No. 56 W. I.—783 of 29th April 1889, the grant for clearance and

maintenance has been fixed for the next five years at Rs. 9,00,000, of which Rs. 1,31,000 are assigned to Major works, the exact grant under that head being fixed according to the detailed budget. This leaves Rs. 7,69,000 only as the maximum assignment for Minor works, whether the full amount of Rs. 1,31,000 be required for Major works or not. As a matter of fact it is not required, and in order that the whole amount of nine lákhs may be fully utilized the Superintending Engineer proposes (para. 6) that the regular budget provision to be made in future for Minor works should be fixed at Rs. 7,76,000 *plus* an amount equal to any saving anticipated on the Rs. 1,24,000 left for major works. The Commissioner would recommend that the Superintending Engineer's suggestion should be accepted.

6. In order that the canals and bunds may be maintained in thoroughly good condition, it is essential that the whole of the grants made for clearance and maintenance should be utilized exclusively for the purpose for which they have been allotted. The Commissioner believes that the frequent complaints regarding the insufficiency of clearance grants have in great part been due to the expenditure of grants intended for clearance upon extensions and improvements, with the result of increasing the area under cultivation in one part of the province, while, owing to the neglect of ordinary clearance, other parts of the country suffer. The first condition of real and steady progress is that the stability of the existing supply should be everywhere assured, so far as it is possible to do so. Then, and not till then, the effect of works undertaken with the object of increasing or utilizing the supply to better effect will be clearly traceable, and so far as the works are successful may be regarded as ground really gained. It is most important, therefore, that a strict line should be drawn between allotments for clearance and maintenance, and those for extensions and improvements, and that separate and liberal provision should be made for the latter. The field for the gradual improvement of the condition of the people, the extension of cultivation and the development of the revenue by means of systematic prosecution of minor extensions and improvements in the canal system is still a wide one. The small inundation canals which form the bulk of those classed under Minor works and contribute so large a portion of the revenue are very much in the same condition now as when the province was conquered, and many of the distributaries of the larger canals, such as the Ghar, the Western Nára, the Fuleli and the Pinyári, are capable of considerable improvement at a trifling cost. Experience has shown that not less than Rs. 1,20,000 will be required for expenditure every year in the direction indicated, and the Superintending Engineer proposes that this amount should be provided in each year's budget for the next five years, and that expenditure on specific projects should be sanctioned by the Commissioner in Sind on the recommendation of the Superintending Engineer. The Commissioner considers that such an arrangement as Mr. Lambert proposes would be attended by the best results. At present every petty project has to be submitted to Government for sanction and the allotment of a special grant, and there is often much delay and uncertainty. If a regular budget allotment were made each year, district and canal officers, knowing that any of their plans which might be approved would be quickly and certainly carried out, would take much more interest than they do at present in improving the irrigational facilities of their charges. With yearly allotments of Rs. 9,00,000 for clearance and maintenance and Rs. 1,20,000 for small improvements and extensions, there is every reason to expect that the revenue of the province will show a profitable increase for some time to come.

7. The Commissioner agrees with the Superintending Engineer that there is no reason why the orders of the Government of India directing that in the case of works having a capital account the canal revenue should be credited with the interest on receipts from sales of occupancy of land under them should not be extended to all canals, whether capital accounts are kept for them or not. The land would be valueless without the water, and in estimating the benefit derived from the canals it is only fair that they should receive credit for all receipts which are directly due to their existence.

8. The figures given in Table A, para. 9 of the report, show that there has been a large increase in the area cultivated, both as compared with the previous years and the average of the previous five years :—

	Kharif.	Rabi.	Total.
	Acres.	Acres.	Acres.
Average area under cultivation for five years ending 1887-88	1,337,264	208,416	1,545,680
Area in 1887-88	1,438,216	215,411	1,653,627
Area in 1888-89	1,648,586	238,970	1,887,556
Increase as compared with average	311,322	30,554	341,876
Increase as compared with 1887-88	210,370	23,559	233,929

The irrigational share of the consolidated assessment on the area cultivated amounted to Rs. 42,25,697, showing an increase of Rs. 7,20,155 over the average for the last five years and of Rs. 5,05,406 as compared with the previous year.

9. These results must be considered highly satisfactory, especially when it is remembered that they have been obtained in spite of an indifferent inundation. The great improvement which has taken place may, in the Commissioner's opinion, be fairly attributed to the greater care and attention which have of late years been given to the clearance and improvement of the canals.

10. Of the new projects mentioned and discussed by Mr. Lambert in paras. 11 to 16 and 19 of the report, all except the Jacobwah have been approved by Government and have either been completed or are in course of execution. The Commissioner has already submitted to Government his opinion on the Jacobwah project. The scheme is one which will mainly benefit Kelat territory, and important political objects may be secured by its execution. It is for Government to decide whether the political considerations involved are sufficiently important to justify the expenditure of a large sum of money which would yield better returns if it were spent in Sind.

11. The amount of Hakaba (water-rate) assessed on land watered by Government canals in Kelat and in Jághirs in Sind is shown below :—

	Kelat.	Sind Jághirs.	Total.
	Rs.	Rs.	Rs.
Hakaba for 1888-89	76,395	61,060	1,37,455
Arrears	67,507	27,315	94,822
Total for collection	1,43,902	88,375	2,32,277
Collections	1,17,173	76,717	1,93,890
Arrears at close of year...	26,729	11,658	38,387

These figures show a great improvement on those of former years in every respect. As compared with 1887-88 there is an increase of Rs. 12,312 in the Hakaba assessed on land in Kelat territory and of Rs. 6,848 in Jághir land. But the most satisfactory feature of the year's returns is the improvement which has taken place in the collection of the water-cess due on Kelat lands. The outstanding arrears have been reduced from Rs. 67,507 to Rs. 26,729, mainly owing to the efforts of Captain Temple, the Political Agent for North-Eastern Beluchistan, to whom much credit is due for the care and attention which he has devoted to this matter.

12. The Superintending Engineer notes in para. 19 that while there has been an increase of 246 acres in the area cultivated in Jághirs in the Shikárpur District, the assessed water-rate has decreased by Rs. 639, and in Hyderabad a decrease of 681 acres in the area cultivated has been accompanied by an increase of Rs. 6,661 in the amount of assessment. He considers that these results are unaccountable, but they are in point of fact quite consistent with the method according to which the assessments are fixed. A higher rate is charged on rice than on dry-crop land. Hence if the area under dry-crop increases and that under rice diminishes, there may be, and often is, an increase in the total area cultivated and a decrease in the assessment. Similarly an increase in the

rice area and decrease in the area under dry-crop may lead to an increase in the assessment though the total area under cultivation has decreased. The water-cess charged is also liable to revision and enhancement on the re-grant of a Jághir, and in comparing the results of different years these changes must be taken into account.

13. It will appear from para. 22 of the report that the difference between the water-rate charged on Jághir land and the full assessment which would be leviable if the land were not alienated amounts to Rs. 4,09,418. This represents the loss to Government on account of these alienations. The Superintending Engineer advocates the imposition of an increased cess on all areas cultivated in Jághirs in excess of the areas under cultivation at the time of the first settlement. It must be remembered, however, that these Jághirs were granted under the guarantee of the British Government after the conquest of the country; and since land in Sind is valueless without a supply of water, the grant of land necessarily carries with it the grant of a right to such a supply of water as may from time to time be available. The imposition of water-rates equal to the full assessment charged on Government land would be practically a confiscation of the Jághirs, and any increase in the water-rates is equivalent to a partial resumption. The Commissioner considers that such enhancements should be made with the greatest caution, and only in cases where it can be clearly shown that owing to expenditure incurred by Government there has been a distinct improvement in the water-supply.

14. The question raised in para. 24 regarding the imposition of assessment on groves of bábul trees (*huris*) which are irrigated by canal water is now under consideration and will shortly be dealt with in the Revenue Department. It may be stated, however, that these groves have for the most part been formed in places where, owing to want of proper control, waste water from canals has run into hollows. It is seldom found that water is purposely drawn off for the cultivation of bábul trees. Also the fallow rules now in force provide for the levy of assessment on all land not under crops, at least once in five years, and under this arrangement bábul groves throughout the province, except the small area held rent-free under Huri grants, must pay an average yearly assessment of annas 10 per acre. The loss suffered by the canal revenue on this account is therefore much less than is supposed by the Superintending Engineer.

15. From the statement given in para. 26 it will be seen that the consolidated assessments for collection, including the balances outstanding at the end of the previous year, amounted to Rs. 47,30,651, of which Rs. 46,83,568 were collected within the year. The outstanding balance amounted to Rs. 47,083, or a little more than one per cent. on the total amount demanded. The irrigation share of the amount recovered was Rs. 42,15,214.

16. The receipts on account of canal revenue under all heads are summarised below:—

	Rs.
Irrigation share of consolidated assessment ...	42,15,214
Hakaba	1,94,135
Miscellaneous revenue	49,604
	44,58,953
Average of previous five years	36,87,212
Increase ...	7,71,741

Thus there has been an increase of 20 per cent. on the average receipts of the past five years.

17. The remissions given amounted to Rs. 63,045, or Rs. 65,521 less than the average. With regard to these remissions Mr. Lambert remarks (para. 30) that "the causes which rendered them necessary are unexplained, as the Executive Engineers generally state that there was no deficiency of water in the canals." Mr. Lambert might easily have satisfied himself by reference to the Collectors as to the causes for which the remissions were given. The supply of water was notoriously short in the Begári and the lower part of the Western

Nára. This was the natural result of a low inundation, and ample evidence of the fact is to be found in the detailed remarks regarding the condition of the different canal divisions which form the latter portion of the report. Thus of the Shikárpur canals it is said (para. 52), "the supply is stated to be not altogether satisfactory"; of the Western Nára (para. 66), "complaints were received of want of water at the tails of Gillespiewah, the Kakol and Kudan"; and of the Karáchi canals (para. 102) "during the whole of the season the river remained below the height necessary to give a full supply to the canals, with the exception of about twelve days." The remissions were heaviest in the Karáchi District, where they amounted to Rs. 31,561. Of this sum, however, Rs. 18,642 only were on account of failure of the canals, the remainder being due to other causes. Zamindárs are not entitled to remissions when their water-courses are not properly cleared, as Mr. Lambert appears to suppose, and remissions for deficiency of water on lands under Government canals are only given after reference to the Engineer in charge.

18. The figures of expenditure given in this report are for the financial year ending the 31st March 1889, while the receipts shown are those for the revenue year ending the 31st July 1889, and represent the revenue derived from the area cultivated during the inundation season of 1888. Only a portion of the expenditure shown was incurred in putting the canals and bunds in good order for the inundation of 1888 and consequently no inferences of any value for administrative purposes can be drawn from a comparison of the expenditure with the receipts. As noted above (para. 2) the Commissioner considers that it would be better if the expenditure incurred on account of each inundation season were shown in future revenue reports. It will then be possible to judge what effect variations in the amount expended upon clearance have upon the receipts from the canals. For administrative purposes the comparison would be most interesting and valuable. The figures now given are of value only from a financial point of view. They have no connection with the rest of the report; and such deductions as are made from them in para. 39 as to the cost of maintenance per acre and the percentage expenditure on revenue are fallacious.

19. The expenditure on maintenance and improvements, which amounted to Rs. 15,73,350, shows an increase under all heads as compared with the average of the previous five years. If the conventional charge of 10 per cent. on account of revenue collection charges which naturally increases with increased receipts be omitted, the increase stands at Rs. 59,456. The charges on account of establishment are practically identical with those of the previous year, while the expenditure incurred on account of works was less by Rs. 1,21,052. In para. 38 of Mr. Pritchard's review of the report for 1887-88, attention was called to the necessity for supplying details of this expenditure and for controlling the tendency to increase in the cost of establishment debited to Works. The details have been supplied in the departmental irrigation report to which Mr. Lambert invites reference. Mr. Pritchard's review was published too late, however, to affect the character of the outlay during the financial year which is there dealt with. Mr. Lambert's conclusion that "judging by the increased results obtained it appears to have been sufficient for the season" is hardly to the point. As noted in the last paragraph, only a comparatively small part of the expenditure shown was on account of the season dealt with in the report.

20. The amount spent on extensions and improvements was Rs. 1,32,558, or Rs. 19,059 less than the average, and most of the money was spent on protective bunds, from which no direct increase in the revenue is to be expected. The opportunities for the profitable expenditure of capital in the improvement of canals are so numerous that it is to be regretted that so little has hitherto been done in this direction. But the attention of revenue and canal officers has now been drawn to the necessity for carefully watching the working of the canals in their charges and suggesting and preparing schemes for their improvement. Some progress has been made during the current season, and if Government will sanction a yearly grant of Rs. 1,20,000 for expenditure on extensions and improvements, as suggested in para. 6 of this memorandum, a steady increase in the revenue of the province may confidently be expected.

21. The statement given in para. 41 of the report shows that all the works in Sind for which capital accounts are kept have more than fulfilled the expectations which were entertained at the time proposals for their construction and improvement were put forward. The Major works estimated to irrigate an area of 444,131 acres actually irrigated 575,745 in 1888-89; while the Minor works irrigated an area of 76,069 acres greater than was anticipated. These figures are interesting as showing that, so far as capacity for irrigation goes, canals projected in Sind may be relied upon to give results better than those calculated upon. It cannot be too constantly borne in mind that practically the whole revenue in Sind depends upon its canal system and on the facilities afforded for controlling, distributing and utilizing the waters of the Indus, without which the province would be a desert. The marked development which has taken place of late years is due in a great measure to the influx of capital in connection with the Afghan war expenditure, to the outlet for surplus agricultural produce afforded by the opening of the railway and the state of the European markets, and to the growth of intelligence and enterprise among the people. With these aids the water poured into the country year by year has been much more completely utilized than previously. But development will soon reach its limits unless the supply of water be not only maintained but increased. In most parts of the province the canals are now doing all that can be expected of them, and except in the south of the Hyderabad and Karáchi Districts, where much may still be done in the way of minor improvements, every drop of water is utilized. In the case of the Western Nára the Commissioner has found it necessary to prohibit any waste land being given out for cultivation until the water-supply has been augmented by the completion of the Pritchardwah. In the way of minor improvements steady progress may be made for some time to come if the yearly grant of Rs. 1,20,000, recommended in para. 6 of this memorandum, be sanctioned as proposed. For any really considerable increase we must now look mainly to large projects involving comparatively heavy outlay. But given an increased supply, the increase of revenue will be as certain as the result of any human undertaking can be, at the same time that every addition to the permanently cultivable area will re-act on the capability of the province for further development. Schemes for the improvement of the Begári, Sukkur and Ghár canals are now engaging the earnest attention of the local officers, and it is hoped that complete projects for two of these canals will be ready before the end of the year.

22. Mr. Lambert's report is fuller and at the same time clearer in many material points than the reports of previous years. The tables given in the body of the report are sufficient to give a very clear idea of the excellent results which have been attained during the year under report. The Commissioner considers that credit is due to Mr. Lambert and the Irrigational Officers of the province for the care and industry which they have shown in the discharge of their arduous and important duties.

A. C. TREVOR,
Acting Commissioner in Sind.

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1889-90.

[Price—Rs. 0-8-6.]

BOMBAY BRANCH
OF THE
Royal Asiatic Society.
CLASS

ANNUAL IRRIGATION REVENUE REPORT,

SIND,

1889-90.

INDEX.

	Pages.
General review of the results for the whole Province	1 to 20
Begári Canals	20
Shikárpur Canals	21
Ghár Canals	21 & 22
Eastern Nára Canals	22 to 26
Hyderabad Canals	26 to 28
Fuleli Canals	28 to 30
Karáchi Canals	30 to 32
Table I.—Cultivation and water share of net consolidated revenue for 1889-90 and three previous years	33
Table II.—Area of cultivation and Canal revenue for 1889-90 and five previous years	33
Table III.—Area of cultivation and Canal revenue for 1889-90	34
Table IV.—Revenue expenditure on new works, maintenance and repairs and revenue collection charges in the Civil Department for 1889-90	35
Table V.—Cultivation, Canal revenue and expenditure for 1889-90 as contrasted with three previous years	36
Table VI.—Direct and indirect receipts of Canal revenue for 1889-90 ...	37
Table VI.-A.—Actual direct and indirect receipts of Canal revenue in 1889-90 as shown in General Revenue Accounts of Executive Districts prepared by the Examiner, Public Works Accounts	38
Table VII.—Area of cultivation and consolidated revenue for 1889-90 ...	39
Table VII.-A.—Comparative statement showing increases or decreases under heads Kharíf and Rabi and Irrigation share of net consolidated assessments for 1888-89 and 1889-90	40
Table VII.-B.—Statement showing receipts from sale of occupancy rights in waste or other lands not belonging to the Irrigation Capital Account Works, but directly benefited by their construction, for the year 1889-90	41
Table VIII.—Discharges of certain canals, areas of crops of different kinds irrigated, and duty of water per cubic foot of supply for Kharíf season, 1889 ...	42
Table IX.—Rainfall in the Province of Sind for 1889-90...	43
Memorandum showing amount of loss to canals on account of difference between assessments of water rates on Jághir lands and the assessments at the ordinary rates in force for Government lands	44
Statement No. I.-B.—Capital account of Irrigation works in Sind for and to end of 1889-90...	45
Statement I.-C.—Statement showing financial results of Irrigation works in Sind for the year ending 31st March 1890. Realizations under main heads of revenue and working expenses	46
Statement II.-C.—Statement showing financial results of Irrigation work in Sind based on actual receipts. Principal results of operations for the year ended 31st March 1890	47
Statement III.-C.—Demands and realizations during the year 1889-90 in Sind ...	48
Statement IV.-C.—Statement showing the financial results of Irrigation works in Sind for the year 1889-90 based on assessments of the year. Principal results and operations for the year ended 31st March 1890	49
General abstract of financial results of Irrigation works in Sind for and up to the close of 1889-90	50 & 51
Series of readings on the Bukkur and Kotri gauges	52
List of highest readings on the Bukkur and Kotri gauges for ten years from 1880-89	53
Letter from the Superintending Engineer in Sind, No. 4405, dated 24th December 1890	54
Memorandum from the Commissioner in Sind, No. 563, dated 17th February 1891.	54 to 57
Chart showing readings at Kotri and Bukkur gauges for 1889	
Index map of the Province of Sind	

ANNUAL REVENUE REPORT

OF THE

IRRIGATION DEPARTMENT IN SIND

FOR 1889-90.

The inundation of 1889 was exceptionally good. The river began to rise in the end of May, and steadily increasing till it reached its maximum height at Bukkur on 19th of July, fell gradually, with the exception of two slight fluctuations in August, passing the 12-foot limit on 7th of September. To perfect this curve only some slight alterations are necessary. It should have reached the 12-feet reading about 10 days earlier, and passed below it a week later, and it would have been more satisfactory had the maximum been attained in the middle of August instead of in July. The rainfall was above the average, but falling chiefly in July and August when most wanted, and after the river had reached its greatest height, its effect was more favourable or less disastrous than is generally the case when a good inundation is accompanied by heavy rain.

2. Although this inundation may take its place among the best we have had for many years, whether judged by their height and duration, or by their results, its effect on the country was not wholly beneficial. Floods have hitherto invariably followed inundations above the average; but their extent is evidently being contracted by the consolidation and extension of river embankments, and as these approach perfection and completion, we may hope to arrive at a time when injury from this cause will be reduced to a minimum or disappear entirely, except in seasons of exceptionally heavy rain accompanying an unusally high river. The season of 1889 was unfortunately not an exception, and its otherwise favourable outlook was marred by the occurrence of three floods in different parts of the Province. Almost the whole of the Rohri District was swept by a flood formed by the junction of the spill from the river in the Ubaoro Táluka with a large volume of water that poured in from the Bhawalpur State on the north and east. These floods, having joined, flowed down the Nára Valley, and after doing considerable damage to the bunds, canals, and cultivation in Thar and Párkar, passed into the sea. The portion of this flood that came from Bhawalpur has not appeared in this district since 1878; and it is worthy of remark that although the river at Bukkur registered higher in 1882 than in 1878 or 1889, there was no flood from that direction in that year. This can only be accounted for by the fact that there is no fixed relation between the height of the river at Bukkur and at the source of the Bhawalpur flood in different years. On the same side, but considerably to the south, the spill from the river opposite the town of Jhirak became unmanageable from the continued prevalence of strong south-westerly winds. There was no embankment, and a wide and deep channel was quickly formed through the sandy soil. It was found impossible to stop the rush of water, and a flood resulted which swept over the Guni, Mirpur and Jati Tálukas, submerging a large area of cultivation, but also soaking much land which was hitherto unwatered, and leaving it ready for rabi sowings. The third flood occurred on the right bank through two large breaches in the Mithu Bund, north-east of the important town of Lárkhána, which narrowly escaped destruction. The water from these openings divided, a part going north of Lárkhána, and crossing the Ghár and several of its branches, passed off into the channel of the Old Sir floods south-west of Shahdádpur. The other half, crossing the Fordwah, passed to the south of Lárkhána, and finally disappeared in the Hamal Dhund in the Nasirabad Táluka, after swamping much of the finest cultivation on the tails of the Ghár. Both portions of this flood were stopped for a time by the railway bank, but the water rose so rapidly that four openings had to be made, through which these large volumes of water were safely passed. The zamíndárs and the people generally must have suffered heavily in the parts affected by these floods, but the gain from the increase of rabi cultivation more than compensates Government for the loss from remissions for the flooded kharíf crops.

3. It will be noted from the charts of the Kotri and Bukkur gauges, that the curve of the former is more favourable during August and September. This is generally the case, but the difference is more marked when the highest readings occur in the first half of the inundation. The reason is, that the velocity of all rivers like the Indus decreases as they approach the sea, obstruction from bends, from bars and from snags increases, with the result that a flood-wave takes a longer time to pass off through the lower reaches than it does higher up. When the maximum rise occurs in the last half of the season, more of it is used up and distributed on its way down than would have been consumed had it happened earlier; hence an early rise has a more marked disturbing effect on the Kotri gauge readings.

4. The removal of snags from the river wherever they appear, but especially when they show in the mouths and ends of the dhunds from which many of the canals are fed, is a most important work. The thousands of trees that are annually swept into the Indus must be a fruitful cause of its many eccentricities. In addition to the removal of accumulations and snags after they have appeared, something might be done, by way of prevention, by the timely clearing away of all trees from land in course or danger of erosion.

5. The volume of water discharged by the river in 1889 must have been very considerably in excess of that of 1888, and the consequent movement in and change of bed must also have been greater. It seems probable that some relation between the height of succeeding inundations might be deduced, which would be useful and interesting, if observations were taken to register these alterations.

6. In paragraph 7 of their observations on the Revenue Report of 1888-89 the Government of India remark: "There can be no doubt that much of the water-supply that might be made available runs to waste in consequence of the haphazard and unscientific manner in which the bed-levels of the canals have been fixed and their sections excavated. It would seem that no proper system has hitherto been followed in this respect, as the connection between the bed-level of the heads of the various canals and the river-gauge at Bukkur has never been accurately determined." The level of the river at any point is affected to such an extent by every change of course that occurs in its vicinity, and by the constant movement of the deep water channel from side to side, arising from instability of bed, that it has no fixed relation to the height at Bukkur or at any place not subject to the same influences. This fact is well known, but its truth is verified by the readings of gauges at different places, some north and some south of Bukkur, shown in the following table:—

Bukkur Gauge.		Year.	Begári Canals.		Shikárpur Canals.	Hyderabad Canals.			
			Desert Canal mouth.	Begári Canal mouth.	Sind Canal mouth.	Renwah mouth.	Great Márak mouth.	Little Márak mouth.	Sangrowáh mouth.
			1	2	3	4	5	6	7
Gauge reading.	Date and month.		Gauge readings (1 day earlier.)		Gauge readings (1 day earlier.)	Gauge readings (2 days later.)			
Ft. Dec.			Ft. Dec.	Ft. Dec.	Ft. Dec.	Ft. Dec.	Ft. Dec.	Ft. Dec.	Ft. Dec.
12·50	18th July ...	1881	9·25	10·50	...	8·30	9·78	7·25	8·52
12·83	3rd „ ...	1882	8·10	10·50	10·20	8·90	9·80	7·99	9·19
12·42	29th „ ...	1883	7·45	10·60	9·40	6·73	9·53	7·98	9·28
12·50	8th „ ...	1884	9·90	11·30	10·20	9·70	9·83	7·85	8·27
12·58	11th August ...	1885	10·55	12·25	11·40	11·63	10·87	8·63	9·53
12·50	19th „ ...	1886	7·20	12·35	10·50	12·97	11·72	9·55	10·73
12·42	17th July ...	1887	9·60	10·90	8·65	10·15	8·80	7·77	8·68
12·50	23rd „ ...	1888	10·20	11·95	9·30	7·60	10·30	8·13	9·35
	Varied— From ...	...	7·20	10·50	8·65	6·73	8·80	7·25	8·27
	To ...	...	10·55	12·35	11·40	12·97	11·72	9·55	10·73

Bukkur Gauge.		Year.	Begári Canals.		Shikarpur Canals.	Hyderabad Canals.			
			Desert Canal mouth.	Begári Canal mouth.	Sind Canal mouth.	Renwah mouth.	Great Márak mouth.	Little Márak mouth.	Sangrowah mouth.
			1	2	3	4	5	6	7
Gauge reading.	Date and month.		Gauge readings (1 day earlier.)		Gauge readings (1 day earlier.)	Gauge readings (2 days later.)			
Ft. Dec.			Ft. Dec.	Ft. Dec.	Ft. Dec.	Ft. Dec.	Ft. Dec.	Ft. Dec.	Ft. Dec.
13·50	5th August ...	1881	11·70	11·30	...	9·40	10·90	8·37	9·60
13·50	8th July ...	1882	9·05	11·90	10·55	9·05	10·00	8·10	9·30
13·42	6th „ ...	1883	8·95	11·40	10·40	5·47	8·27	6·65	7·72
13·50	11th „ ...	1884	10·65	12·40	11·40	11·60	10·53	8·45	8·88
13·50	14th August ...	1885	12·00	13·10	12·40	11·70	11·50	9·00	10·00
13·50	22nd „ ...	1886	8·70	12·10	10·40	12·17	11·00	8·90	10·50
13·33	23rd July ...	1887	10·30	11·10	8·90	10·40	9·53	8·15	9·38
13·50	13th „ ...	1888	8·70	10·75	7·80	5·90	8·90	6·88	7·75
13·50	14th August ...	1889	11·30	10·40	9·80	10·75	11·55	9·40	10·30
	Varied— From... ...		8·70	10·40	7·80	5·47	8·27	6·65	7·72
	To		12·00	13·10	12·40	12·17	11·55	9·40	10·50

It is evident from this that a height of 12′ on Bukkur gauge would in some years mean 4′ at a canal 100 miles or so distant, while in others it might give any reading up to 8′ or 9′ at the same place. At places on the river, where the course is permanent and the section liable to slight alterations as at Bukkur, Kotri and Jhirak, the relation between the water-level in different years is much closer, though not fixed. It is essential, for efficiency in the working and for economy in the maintenance of canals in Sind, that their bed-levels should be determined yearly, so as to give a certain minimum supply throughout the season; and it is evident that this desirable result cannot be obtained from beds fixed with reference to any permanent datum. The water-level of each canal taken when it is in full work is the only line from which the bed-level for the next year can be satisfactorily laid down. This can be easily found in Sind, as there are stone bench marks along the berms of almost all canals, from which the water-level can be readily taken and plotted when it becomes an easy task to settle the exact depth required at any point.

7. There appears to have been no serious or violent changes in the course of the river during the inundation, and erosion, though continuing at places noticed in previous reports, did not develope any dangerous symptoms so as to make further precautions against its effects necessary.

8. There were five leaks in the Kashmor Bund during the inundation; they were all quickly detected and closed without doing any damage. Owing to the continued set of the river on this side, water stood at the dangerous height of 9·90′ against the 39th mile of this bund, but there appears to have been no corresponding increase in the rate of encroachment. The Abkaláni establishment was reduced at the commencement of the season by 150 Beldárs and 2 Mukádams. The efficiency of an establishment of this nature depends on the power, given by it, of concentrating in the shortest possible time an overwhelming body of men at one place, while keeping a sufficient number always on the alert. The danger of asking too much from men on whose vigilance so much depends is great and self-evident, and it is doubtful if it is worth incurring for the sake of a few thousand rupees.

The Sukkur-Begári Bund stood staunch, with the exception of 3 leaks, which were easily closed. There was no serious change in the river opposite this bund.

South of Sukkur there was a breach in the Saidábád bund, which, however, was closed before much damage was done.

The Jháli bund remained firm and unbreached; but there were two large breaches in the Mithu bund further south, through which the floods described above swept over the country round Lárkhána. There were a few breaches of minor importance in the line of bunds south of Lárkhána, but on the whole they stood well, although in several places water touched them for the first time for years.

The only other important bunds are in the Karáchi District, where the river is now embanked on both sides. The set of the river throughout the season was very pronounced against the left bank in this district, with the result that there were on this side eight breaches, only one of which was closed. The unusual height to which the water rose on the left bank must be accounted for by the deep channel of the river being all along on that side, and its effect was probably increased at times by unusually high tides and strong south-westerly winds. The great number of breaches that have occurred of late years at sluices in the river embankments points to the probability of their design or construction being faulty, and it will be advisable for the future to provide for greater strength in the former, and for more constant and efficient supervision for the latter. The Abkaláni establishment in this district also has been considerably reduced; as before remarked, by keeping up a weak establishment of this nature, we are greatly increasing the risk of rendering the whole expenditure on it unprofitable, and of bringing about loss to Government and to the people, out of all proportion to the small sum saved by its reduction.

9. A detailed account of the working of the principal canals will be given when discussing each district. Many of these worked well, especially those of later construction; but some of the older canals are still so faulty in alignment, so choked and obstructed by jungle, trees and roughness of slopes, that they cannot carry on the silt with which their water is charged, but drop it within a short distance, there to remain till excavated again, meanwhile effectually reducing the supply all down the canal. By yielding to the incessant demand for extra clearance in such canals as these, we are merely adding to the results of the defects from which they suffer, and increasing our expenditure, present and prospective, without the possibility of any adequate return. To faults such as those above enumerated, and to the want of an efficient and thoroughly trained revenue and conservancy establishment with proper facility for supervision of works and inspection of water distribution, fully one-third of the deposit now yearly to be removed is due; and it is to their correction that the sum of Rs. 1,20,000, if placed at the disposal of the Superintending Engineer, as suggested in last year's report, could be most usefully and beneficially applied. Before, however, Government and the cultivators can reap the full benefit of the yearly expenditure on maintenance and repairs, works for more extensive improvement will be necessary in many canals, involving extra establishments and increased grants.

10. The following statement gives the agricultural results of the inundation and the net consolidated assessment thereon, comparing them with those of the five preceding years:—

STATEMENT A (FOR DETAILS *see* TABLE VII.)

Year.	Assessed Area of Cultivation.			Irrigation share of net consolidated Assessment.
	Kharíf.	Rabi.	Total.	
	Acres.	Acres.	Acres.	Rs.
1884-85	1,353,960	232,319	1,586,279	36,16,370
1885-86	1,288,855	243,867	1,532,722	34,33,190
1886-87	1,407,778	185,888	1,593,666	35,89,499
1887-88	1,438,216	215,411	1,653,627	37,20,291
1888-89	1,648,586	238,970	1,887,556	42,25,697
Average...	1,427,479	223,291	1,650,770	37,17,009
1889-90	1,722,040	387,764	2,109,804	45,83,932
Increase or Decrease ...	+294,561	+164,473	+459,034	+866,923

These figures are eminently satisfactory, and prove conclusively that the steady growth of cultivation that has prevailed now for some years shows as yet no signs of halting, but on the contrary is developing, with yearly increasing strides. Contrasted with the averages of the five preceding years and with those of last year, the figures of cultivation and assessment for 1889 show the following remarkable results :—

1st.—A total increase of 459,034 acres (294,561 kharíf and 164,473 rabi) of cultivation, and of Rs. 8,66,923 assessed revenue over the five years' average ; and

2nd.—An increase of 222,248 acres (73,454 kharíf and 148,794 rabi), and of Rs. 3,58,235 revenue over the figures for last year.

This result is exclusive of the cultivation or returns of jághir lands. The large increase of rabi was to be expected from the area affected by floods, and it is most satisfactory to see that it has not been gained at the expense of the kharíf crop, which also shows a considerable advance beyond the limit of last or preceding years. It is interesting to compare the figures of cultivation and revenue for 1878 with those of this year, as the inundations which furnished them are in many respects alike. Both were accompanied by extensive floods, and both were exceptionally good, that of 1878 being the "best on record,"—and judged by its curve of rise and fall it is still unbeaten, though it would take a low place now if tested by results. The figures of both years are given below ; they include jághir cultivation and hakába, and they show a net result of 333,730 acres of cultivation and Rs. 17,43,660 in favour of 1889. It is worthy of remark that the area under rabi in 1878 exceeded that of 1889 by 164,005 acres, while the kharíf area was less by 388,494 acres, leaving a balance in favour of the latter year of 224,489 excluding jághir cultivation. This result is remarkable and satisfactory, as showing the large expansion of kharíf cultivation that has taken place, due to the protection and confidence given by the extension of the river embankments. To these works, to the new canals that have been made, and to the improvements carried out in some of the old ones the large increase of Rs. 17,43,660 of revenue is due :—

Year.	Area of Cultivation.				Total Cultivation.	Irrigation share of net consolidated Assessment.	Hakába.	Total Revenue.
	Government.			Jághir Kharif and Rabi.				
	Kharif.	Rabi.	Total.					
	Acres.	Acres.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.
1878-79	1,333,546	551,769	1,885,315	130,774	2,016,089	29,57,162	35,750	29,92,912
1889-90	1,722,040	387,764	2,109,804	240,015	2,349,819	45,83,932	1,52,646	47,36,578
Results ..	+388,494	—164,005	+224,489	+109,241	+333,730	+16,26,770	+1,16,896	+17,43,660

11. Statement B given below shows the totals of A for 1888-89 and 1889-90 distributed by canal districts, and contrasts the results in each district. :—

Statement B (*vide* Table VII A).

District.	1888-89.			1889-90.			Results.		
	Cultivation.		Irrigation share of net consolidated Assessment.	Cultivation.		Irrigation share of net consolidated Assessment.	Cultivation.		Irrigation share of net consolidated Assessment.
	Kharif.	Rabi.		Kharif.	Rabi.		Kharif.	Rabi.	
	Acres.	Acres.	Rs.	Acres.	Acres.	Rs.	Acres.	Acres.	Rs.
Begári Canals	249,727	29,509	5,20,162	248,357	15,156	4,93,247	—1,370	—14,353	—26,915
Shikárpur Canals	110,952	26,181	3,55,136	115,083	21,260	3,56,162	+4,131	—4,921	+1,026
Ghár Canals	365,498	63,054	12,10,725	371,093	106,939	12,99,287	+5,595	+43,885	+88,562
Eastern Nára	163,526	50,174	3,89,214	172,287	109,366	4,84,688	+8,761	+59,192	+95,474
Hyderabad Canals	317,405	16,965	6,64,710	337,758	27,467	7,29,285	+20,353	+10,502	+64,575
Fuleli Canals	225,820	26,674	5,46,719	249,126	49,790	6,16,540	+23,306	+23,116	+69,821
Karáchi Canals	215,658	26,413	5,39,031	228,336	57,786	6,04,723	+12,678	+31,373	+65,692
Total ..	1,648,586	238,970	42,25,697	1,722,040	387,764	45,83,932	+73,454	+148,794	+3,58,235

It will be seen from the above figures that the increase of kharíf cultivation was general over the Province, but in the Begári District, where last year it was greatest it is now least, and the Fuleli District which showed almost the lowest increase last season now heads the list. The former result is attributed to the unfavourable action of the river on the dhund which feeds the Unharwah and Begári, and to the fact that the latter canal was worked beyond its capacity in the previous year. The latter is due to the increased expenditure on the tails of the Fuleli, by which the usual damage from flooding was reduced, and to improvements in the Old Fuleli, by which the water-supply of the Hyderabad and Dero-Mohbat Tálukas was increased. The total increase of kharíf cultivation is 73,454 acres and is pretty evenly distributed over all the canals, as shown from Table VII A,—with the principal exceptions of the Unharwáh, Begári and Eastern Nára, which show fallings off of 6,065, 11,344 and 7,974 acres, respectively. The decrease in the last-named district is owing to the flood. In the rabi crop there is the large increase of 148,794 acres to be recorded, to which all the districts, with the exception of Begári and Shikárpur, contributed. In these districts there was a decrease of rabi of 14,353 and 4,921 acres, respectively. The Eastern Nára, Ghár and Karáchi Districts, which suffered most from the floods, show the largest increase under this head. There is a total increase of net consolidated assessment of Rs. 358,235, in which the Begári District alone has no part, showing a falling off of Rs. 26,915 for reasons explained above. The action of the river on the feeder of the Begári and Unharwah canals is most probably uncontrollable, and to it the deficiency in the latter canal is due, but in the case of the Begári, its prejudicial effect is increased by defects in the canal itself, arising principally from its being overworked; an estimate for special clearance to a uniform bed gradient has been submitted, and other projects for the purpose of relieving the canal of some portion of its duty are in course of preparation.

12. In the following table is exhibited, for each district, the Irrigation share of the net consolidated assessment on Government land for the six years ending 1889-90, the figures for which year are contrasted with the average of the five preceding, and the result given :—

STATEMENT C (*vide* TABLE VII).

Year.	Begári Canals.	Shikárpur Canals.	Ghár Canals.	Eastern Nára Canals.	Hyderabad Canals.	Fuleli Canals.	Karáchi Canals.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1884-85	3,76,829	2,64,978	12,61,668	2,03,157	6,04,356	3,72,799	5,32,583	36,16,370
1885-86	4,10,224	2,81,037	10,14,958	2,17,190	5,93,303	3,92,485	5,23,993	34,33,190
1886-87	3,69,932	3,08,363	10,39,583	2,56,550	6,00,052	4,74,182	5,40,837	35,89,499
1887-88	3,80,624	3,22,473	10,31,119	3,15,802	6,13,847	5,29,157	5,27,269	37,20,291
1888-89	5,20,162	3,55,136	12,10,725	3,89,214	6,64,710	5,46,719	5,39,031	42,25,697
Average	4,11,554	3,06,397	11,11,610	2,76,383	6,15,254	4,63,068	5,32,743	37,17,009
1889-90	4,93,247	3,56,162	12,99,287	4,84,688	7,29,285	6,16,540	6,04,723	45,83,932
Increase or Decrease	+81,693	+49,765	+1,87,677	+2,08,305	+1,14,031	+1,53,472	+71,980	+8,66,923

The assessments show a marked, and for the most part, progressive improvement thoughout the six years, and those for the year under report show a generally distributed increase of Rs. 8,66,923 over the average of the five preceding years.

13. The following table shows the area of cultivation and the assessment of jághir lands, unrealized balance at end of last year, actual realizations and outstanding balances at end of year under report :—

STATEMENT D (*vide* TABLE III).

Abstract showing Area of Cultivation and Assessment and Balances due on account of Jághir Lands in Sind for 1889-90.

Districts.	AREA CULTIVATED DURING YEAR.			Unrealized balance at end of last year.	ASSESSMENT OF YEAR.		Total for collection.	Remissions.	Net total realizable.	Actual realizations during year.	Balance outstanding at end of year.
	Kharif.	Rabi.	Total.		Area.	Amount.					
1	2	3	4	5	6	7	8	9	10	11	12
	Acres.	Acres.	Acres.	Rs.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Khelát	67,254	12,691	79,945	26,729	79,945	79,933	1,06,712	1,511	1,05,201	92,443	12,758
Upper Sind Frontier	1,038	9	1,047	224	1,047	509	733	77	656	652	4
Shikárpur	29,977	3,434	33,411	2,933	33,411	14,096	17,028	...	17,028	9,604	7,424
Thar and Párkar ...	1,637	916	2,553	1,122	2,553	1,206	2,328	...	2,328	1,191	1,137
Hyderabad	99,580	5,226	104,806	4,998	104,806	39,854	44,852	...	44,852	41,333	3,519
Karáchi	15,105	3,148	18,253	2,382	18,253	7,171	9,553	2	9,551	7,373	2,178
1889-90	214,591	25,424	240,015	38,387	240,015	1,42,819	1,81,206	1,590	1,79,616	*1,52,596	27,020
1888-89	205,843	25,236	231,079	94,822	231,079	1,37,455	2,32,277	...	2,32,277	1,93,890	38,387
Increase or Decrease	+8,748	+188	+8,936	−56,435	+8,936	+ 5,364	−51,071	+1,590	−52,661	−41,294	−11,367

	Rs.	Rs.
* Amount realized by Civil Officers	...	1,52,596
,, ,, Public Works Officers ...	49	
,, due to difference of annas and pies ...	1	
	—	50
Total ...		1,52,646

There was an increase of jághir cultivation of 8,936 acres, and of assessment of Rs 5,364, which, though not equal to that of the previous year, is still satisfactory. About $\frac{2}{5}$ths of the increase is in Khelát, $\frac{2}{5}$ths in Shikárpur, and the greater part of the remaining fifth in Hyderabad, while there is a decrease of 88 acres in the Upper Sind Frontier. The total for collection shows a decrease of Rs. 51,071, compared with the previous year's, but as this included outstandings of the years before, which exceeded those of year under report by Rs. 56,435, the amount for collection from the assessment of this year is larger by Rs. 5,364 than that of 1888-89, when of a total sum for collection of Rs. 2,32,277, Rs. 1,93,890, or 83·47 per cent., were actually realized; while in 1889-90 the percentage of realizations rose to 84·21, and the outstandings were reduced by Rs. 11,367. The outstanding balance from Shikárpur has increased from Rs. 2,930 to Rs. 7,424 for which no explanation has been given, while that from Khelát has fallen from Rs. 26,729 to Rs. 12,758, and the Political Agent reports that this will be paid in before 31st July 1890.

14. It has been the practice hitherto to record in the last column but one of Tables VI and VI A the difference arising from the lower rates at which jághir is assessed, as compared with Government land, for each canal; this information has now been omitted in reference to the remarks made by the Government of India in paragraph 11 of their Resolution No. 97-I. of 1890, reviewing the Irrigation Revenue Report of 1888-89.

The following statement, however, is added here, as in a report dealing with the working and administration of the canals it is fair they should get full credit for *all* the water they supply :—

STATEMENT D (1).

Class of Works.	Hakába at present Assessment.	Loss.	Jághir Revenue what it ought to be.	Water share of Government Land Assessment.	Total, what it should be for the Province.
	Rs.	Rs.	Rs.	Rs.	Rs.
Major Works	84,799	87,792	1,72,591	9,67,981	11,40,572
Minor Works, Capital... ...	31,684	1,83,075	2,14,759	15,92,512	18,07,271
Do. Revenue ...	26,336	1,54,259	1,80,595	20,23,439	22,04,034
Total ...	1,42,819	4,25,126	5,67,945	45,83,932	51,51,877

The loss for the year, as thus estimated, amounts to Rs. 4,25,126, or Rs. 15,708 in excess of last year's. The difference is of course due to increase of cultivation and will increase with it.

15. The following statement represents assessment on account of Government and jághir lands irrigated during the year under report, and also those for the five years preceding.

STATEMENT D (2) (*vide* STATEMENT D AND TABLE III).

Years.	ASSESSMENT.		
	Government Land.	Jághir Land.	Total.
	Rs.	Rs.	Rs.
1884-85	36,16,370	1,16,637	37,33,007
1885-86	34,33,190	1,13,802	35,46,992
1886-87	35,89,499	1,23,598	37,13,097
1887-88	37,20,291	1,18,295	38,38,586
1888-89	42,25,697	1,37,455	43,63,152
Average ...	37,17,009	1,21,958	38,38,967
1889-90	45,83,932	1,42,819	47,26,751
Results ...	+8,66,923	+20,861	+8,87,784

From the figures in this statement the increase under both heads, as compared with the average of five previous years, is Rs. 8,87,784; compared with the previous year the increase is Rs. 3,63,599. This increase is due to the favourable inundation and is very satisfactory. The rate of increase on Government land is greater than that on jághir by a little over 6 per cent.

16. In the statement headed E. below are given the totals for collection and actual realizations of the year for the five revenue districts:—

STATEMENT E (DETAIL OBTAINED FROM CANAL RETURNS VIII AND VIII A).

Districts.	Unrealized Balance at end of year.	Deduct Remissions on account of former years.	Net amount realizable on account of outstanding at beginning of year.	Net consolidated Assessment during year as per Canal Return VIII.	Total for collection during year.	Actual Receipts during year.	Balance outstanding at end of year.	Irrigation share of Collection.
1	2	3	4	5	6	7	8	9
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Upper Sind Frontier ...	17,164	3,590	13,574	5,68,372	5,81,946	5,46,338	35,608	4,91,705
Shikárpur	6,064	84	5,980	18,31,800	18,37,780	18,19,332	18,448	16,37,401
Thar and Párkar	* 479	...	479	5,08,852	5,09,331	5,06,780	2,551	4,56,108
Hyderabad	* 766	53	713	15,06,776	15,07,489	15,07,478	11	13,56,730
Karáchi	22,774	2,224	20,550	6,77,451	6,98,001	6,82,492	15,509	6,14,243
Total ...	47,247	5,951	41,296	50,93,251	51,34,547	50,62,420	72,127	45,56,187

* These balances differ from those given in last year's report, but the Revenue officials have communicated them as correct and have been accepted as such.

In the preceding year the total for collection, actual receipts and balance outstanding were Rs. 47,30,651, Rs. 46,83,568 and Rs. 47,083, which have now increased respectively by Rs. 4,03,896, Rs. 3,78,852 and Rs. 25,044. In 1888-89 as nearly as possible 99 per cent. of the sum for collection was actually realized, while in the year under review the proportion was only 98·6. Distributed over the five districts these figures are as follows:—

	Total for collection.	Actual Receipts.	Balance outstanding.
	Rs.	Rs.	Rs.
Upper Sind Frontier	—6,464	—24,908	+18,444
Shikárpur	+92,817	+80,433	+12,384
Thar and Párkar	+96,737	+94,463	+2,274
Hyderabad	+1,45,201	+1,45,994	—793
Karáchi	+75,605	+82,870	—7,265
Total ...	+4,03,896	+3,78,852	+25,044

The unsatisfactory returns from the Upper Sind Frontier, as shown by the sum for collection, is due to the comparative failure of supply in the end of the season, in the Begári and Unharwah, as before explained. The large increase of outstandings in Upper Sind Frontier and Shikárpur has not been explained; in Hyderabad there are practically none, and the considerable decrease in Karáchi is satisfactory.

17. The following statement exhibits the actual realizations on account of hakába on the Jághir area irrigated during the year 1889-90 and that for five preceding years for each canal district, and the total for the division :—

STATEMENT E (1) (*vide* TABLE III).

Years.	Begári Canals.	Shikárpur Canals.	Ghár Canals.	Eastern Nára Canals.	Hyderabad Canals.	Fuleli Canals.	Karáchi Canals.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1884-85	62,445	882	6,343	699	13,827	17,570	4,324	1,06,090
1885-86	52,205	6,391	6,565	361	9,919	16,069	4,527	96,037
1886-87	82,104	4,134	5,616	1,196	20,311	21,983	4,685	1,40,029
1887-88	61,778	2,966	4,201	819	14,479	19,252	9,008	1,12,503
1888-89	1,20,622	3,616	6,489	986	24,929	31,351	6,142	1,94,135
Average	75,831	3,598	5,843	812	16,693	21,245	5,737	1,29,759
1889-90	95,423	2,263	4,423	1,830	17,640	23,694	7,373	1,52,646
Increase or Decrease ...	+19,592	—1,335	—1,420	+1,018	+947	+2,449	+1,636	+22,887

The result for the year, as compared with the average, is a net increase of Rs. 22,887; this is so far satisfactory, but compared with the previous year a falling off of Rs. 41,489 is evident. This is due to a larger share of previous outstandings having been collected in 1888-89, and not to any decrease of cultivation or assessment.

18. In the following statement the miscellaneous canal revenue actually realized in each district for the year under review and five preceding years is presented :—

STATEMENT E (2) (*vide* TABLE III).

Year.	Begári Canals.	Shikárpur Canals.	Ghár Canals.	Eastern Nára Canals.	Hyderabad Canals.	Fuleli Canals.	Karáchi Canals.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1884-85	924	4,220	11,618	17,347	2,086	4,546	9,965	50,706
1885-86	859	1,601	11,202	18,362	3,058	3,692	9,340	48,114
1886-87	883	1,960	9,291	16,526	3,879	6,131	9,787	48,457
1887-88	947	2,073	9,191	15,173	3,307	4,883	9,716	45,290
1888-89	957	2,164	10,001	15,824	3,987	4,809	11,862	49,604
Average	914	2,404	10,261	16,646	3,263	4,812	10,134	48,434
1889-90	821	4,035	13,464	15,708	3,993	4,299	12,847	55,167
Increase or Decrease ...	—93	+1,631	+3,203	—938	+730	—513	+2,713	+6,733

The result for the year under review compares very favourably with the average of five preceding years, as also with that of 1888-89. The receipts under this head vary considerably, being made up of the proceeds of the sale of fish, roots, &c., from the Dhunds, and of grass and seeds from the canal banks. The sale of fish is the chief source of revenue under this head, and this naturally varies with the rainfall and river-supply.

19. The actual realizations of the year under the three heads 'Government land', 'Jághir land' and 'Miscellaneous' have been given separately in Statements E, E (1) and E (2); in the following one they are collected, and the total actual receipts of the province arrived at by adding another column for receipts up to end of 1889-90 for sale of occupancy rights :—

STATEMENT E (3) (*vide* TABLE VI A).

Years.	GOVERNMENT. Irrigation share of net consolidated Assessment collected.	JÁGHIR. Hakába.	Miscellaneous.	Four per cent. of Irrigation share of Proceeds of Sales of Occupancy Rights.	Total actual Receipts.
	Rs.	Rs.	Rs.	Rs.	Rs.
1884-85	36,93,821	1,06,090	50,706	...	38,50,617
1885-86	34,87,863	96,037	48,114	...	36,32,014
1886-87	36,09,629	1,40,028	48,458	...	37,98,115
1887-88	37,46,333	1,12,503	45,290	...	39,04,126
1888-89	42,15,214	1,94,135	49,604	...	44,58,953
Average ...	37,50,572	1,29,759	48,434	...	39,28,765
1889-90	45,56,187	1,52,646	55,167	11,072	†47,75,072
Increase or Decrease ...	+8,05,615	+22,887	+6,733	*+11,072	+8,46,307

* This is made up as under :—

		Rs.
Receipts for 1889-90 ...	...	4,472
,, previous to 1889-90 ...	,,	6,600

11,072, has been credited in the accounts for 1889-90 as the Examiner of Public Works Accounts has treated them thus in the General Revenue Accounts.

† Plus average before improvements.

The occupancy right of 78,531 acres was sold during the year, realizing Rs. 1,24,227, 4 per cent. of the irrigation share of which, or Rs. 4,472, is shown in column 10 of Table VII B as indirect canal revenue. The receipts for the year and also the total realized under this head in previous years for each district are shown here :—

	1889-90.	Up to end of 1888-89.
	Rs.	Rs.
Begári Canals	786	5,620
Shikárpur do.	856	.....
Ghár do.	142	415
Eastern Nára	9	.....
Hyderabad Canals...	1,685	172
Fuleli do.	553	1
Karáchi do.	440	393
Total ...	4,471	6,601

In future, receipts from this source will be shown under "Miscellaneous" in a separate column.

20. The remissions of six years ending 1888-89 are shown in Statement F., in which also their average in each district is contrasted with the amount remitted in the year under report.

STATEMENT F.

Districts.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.	Average.	1889-90.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	4,685	3,376	10,708	20,335	13,032	16,116	11,375	26,930
Shikárpur do.	6,814	369	123	668	101	174	1,374	45
Ghár do.	17,312	27,585	1,12,111	92,277	21,387	9,535	46,701	1,02,906
Estern Nára	910	267	4,413	43	177	874	1,114	4,996
Hyderabad Canals	493	60,391	2,757	3,418	3,031	3,809	12,316	8,817
Fuleli do.	1,036	3,246	1,413	707	3,203	976	1,762	30,918
Karáchi do.	61,621	16,814	24,891	18,971	21,006	31,561	29,144	58,830
Total ...	92,871	1,12,048	1,56,416	1,36,419	61,937	63,045	1,03,786	2,33,442

As was to be expected, the total of the remissions for the year is largely in excess of the average, as arrived at in the statement, which does not include a year of any considerable flood. Compared, however, with the sums granted in the flood years 1874-75, 1876-77 and 1878-79, which were Rs. 4,00,188, Rs. 4,02,486 and Rs. 3,41,703, the remissions for 1889-90 show favourably. The damage done to crops by the river-floods in the Ghár, Fuleli and Karáchi districts accounts for fully $\frac{2}{3}$rds of the total; one-half of the remainder is due to deficient supply in the Begári and Unharwah, as already explained, and the other half is accounted for by injury to, and destruction of, crops by rain and locusts, which latter traversed the whole Province.

21. In all preceding statements the figures refer to assessments and collections for the revenue year ending the 31st July, while in those that follow, dealing with expenditure, they relate to the financial year closing 31st March, and they comprise expenditure incurred partly before and partly after the inundation for which the assessment and collections are taken.

22. In Statement G. following is shown the totals of the expenditure for maintenance and repairs on canals and bunds, and the charges for revenue collections for the six years ending 1888-89. Their average is taken and contrasted with the expenditure and charge for 1889-90 :—

STATEMENT G (*vide* TABLE IV).

Years.	Maintenance and Repairs.			Revenue Collection Charges.	Total.
	Works.	Establishment.	Total.		
	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	8,78,816	2,14,128	10,92,944	2,74,762	13,67,706
1884-85	8,53,757	2,13,717	10,67,474	3,36,613	14,04,087
1885-86	8,31,148	2,48,524	10,79,672	3,16,215	13,95,887
1886-87	8,27,922	2,71,930	10,99,852	3,29,394	14,29,246
1887-88	10,41,501	2,61,116	13,02,617	3,42,170	16,44,787
1888-89	9,20,449	2,61,271	11,81,720	3,91,630	15,73,350
Average	8,92,265	2,45,113	11,37,378	3,31,797	14,69,175
1889-90	9,65,517	2,49,041	12,14,558	4,23,904	16,38,462
Difference	+73,252	+3,928	+77,180	+92,107	+1,69,287

NOTE.—Revenue collection charges are calculated on the revenue year.

There is an increase of Rs. 45,068 for works, and a decrease of Rs. 12,230 for establishment, as compared with the figures of the previous year. The expenditure for the year, as shown in this statement, is given in detail under its several heads, and the works on which it was incurred are described, in the Administration Report (Irrigation) for the Presidency. The expenditure under this head, as described and detailed in these excerpts, demands only one remark, *viz.*, the outlay for the year on jungle-cutting is very small, amounting only to Rs. 11,275, and that on inspection paths *nil* for the whole Province. These are works of primary importance for the maintenance of all canals, and until they are satisfactorily completed, a proportion of the yearly expenditure on clearance in every canal, in some considerable, in others less, is uselessly incurred. What may be called the unnatural or abnormal deposit in Sind canals, especially in the smaller ones, is very great, and is due to the large number of trees, the thickness of the jungle and brushwood on their banks and berms, and to the difficulty of regular inspection during the inundation, for the purpose of removing debris and preventing malicious obstruction made for the purpose of raising level at particular places. It would be beneficial in every way were a special grant made once for all for completing these most necessary works; in default of this a larger share of the

maintenance grant must be devoted to it. Expenditure on works of this nature, when once they have been satisfactorily completed, should not recur, and the conservancy establishment should be held responsible for future maintenance in proper order.

23. In Statement G., under the heading "Maintenance and Repairs," there is a column "Works," the figures in which include expenditure on Abkaláni and supervising establishment, as well as for actual work. It is evidently important that the cost of these establishments should be known and detailed as is now done in the following statement, which shows it for each district for 1889-90 and three preceding years:—

STATEMENT G (*a*).

Districts.	1886-87.					1887-88.				
	Works.	Establishment debitable to Works.			Total.	Works.	Establishment debitable to Works.			Total.
		Supervising.	Abkaláni.	Total.			Supervising.	Abkaláni.	Total.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	57,696	12,303	43,546	55,849	1,13,545	73,958	12,887	38,961	51,848	1,25,806
Shikárpur Canals	72,246	8,906	17,899	26,805	99,051	1,01,811	5,006	14,646	19,652	1,21,463
Ghár Canals	1,03,875	10,681	35,063	45,744	1,49,619	1,25,880	10,190	32,626	42,816	1,68,696
Eastern Nára	23,427	4,725	12,878	17,603	41,030	16,776	4,389	13,366	17,755	34,531
Hyderabad Canals	1,13,070	21,319	...	21,319	1,34,389	1,14,566	24,420	...	24,420	1,38,986
Fuleli Canáls	1,13,653	6,903	10,572	17,475	1,31,128	1,73,505	2,039	17,433	19,472	1,92,977
Kárachi Canáls	1,23,729	...	30,431	30,431	1,59,160	2,27,522	...	31,520	31,520	2,59,042
Total ...	6,04,437	64,837	1,50,389	2,15,226	8,27,922	8,34,018	58,931	1,48,552	2,07,483	10,41,501

Districts.	1888-89.					1889-90.				
	Works.	Establishment debitable to Works.			Total.	Works.	Establishment debitable to Works.			Total.
		Supervising.	Abkaláni.	Total.			Supervising.	Abkaláni.	Total.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals	59,996	12,991	44,716	57,707	1,17,703	87,629	13,084	36,041	49,125	1,36,754
Shikárpur Canals	35,728	4,670	14,303	18,973	54,701	69,717	4,341	10,330	14,671	84,388
Ghár Canals	1,18,172	8,865	27,327	36,192	1,54,364	1,02,504	8,002	32,006	40,008	1,42,512
Eastern Nára	27,826	4,489	14,656	19,065	46,891	29,437	4,043	16,364	20,407	49,844
Hyderabad Canals	1,99,186	20,605	...	20,605	2,19,791	1,59,945	21,892	...	21,892	1,81,837
Fuleli Canals	1,86,013	756	15,661	11,417	2,02,430	2,00,441	5,397	6,296	11,693	2,12,134
Karáchi Canals	94,102	...	30,467	30,467	1,24,569	1,34,242	5,296	18,510	23,806	1,58,048
Total ...	7,21,023	52,296	1,47,130	1,99,423	9,20,449	7,83,915	62,055	1,19,547	1,81,602	9,65,517

The portion of this establishment known as Abkaláni is only engaged during the inundation for the purpose of watching the river embankments. There is a decrease on this head of Rs. 23,847 below the average of three preceding years, which has been commented on in previous paragraphs. The total cost of supervising establishment is pretty much as usual; it is very high in the Hyderabad district. In some districts this establishment is practically permanent, in others it, or the greater part of it, is engaged only for the four or five months during which clearance works are in progress. This latter course is unsatisfactory, and it is hoped it will be found possible to arrange this establishment on a uniform system by which its efficiency will be increased. When work is not in progress the duties of this establishment comprise the revenue management, conservancy and water distribution of the canals, and they should form the nucleus from which the Abkaláni establishment should be developed during the inundation.

24. The following statement shows the outlay incurred on canals and bunds separately for the same series of years as given in Statement G.

STATEMENT G (1) (*vide* TABLE IV).

Years.	CANALS.					BUNDS.				
	Works.	Establishment.	Total.	Revenue Collection.	Total.	Works.	Establishment.	Total.	Revenue Collection.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1883-84	6,99,084	1,75,403	8,74,487	2,73,688	11,48,175	1,79,732	38,725	2,18,457	1,074	2,19,531
1884-85	7,40,540	1,93,796	9,34,336	3,34,972	12,69,308	1,13,217	19,921	1,33,138	1,641	1,34,779
1885-86	7,11,982	2,19,200	9,31,182	3,14,002	12,45,184	1,19,166	29,324	1,48,490	2,213	1,50,703
1886-87	6,62,498	2,23,334	8,85,832	3,28,154	12,13,986	1,65,424	48,596	2,14,020	1,240	2,15,260
1887-88	8,58,758	2,21,266	10,80,024	3,41,424	14,21,448	1,82,743	39,850	2,22,593	746	2,23,339
1888-89	8,03,156	2,20,902	10,24,058	3,90,914	14,14,972	1,17,293	40,369	1,57,662	716	1,58,378
Average ..	7,46,003	2,08,983	9,54,986	3,30,526	12,85,512	1,46,262	36,131	1,82,393	1,272	1,83,665
1889-90	8,64,912	2,19,617	10,84,529	4,22,802	15,07,391	1,00,605	29,424	1,30,029	1,042	1,31,071
Difference ..	+1,18,909	+10,634	+1,29,543	+92,336	+2,21,879	−45,657	−6,707	−52,364	−230	−52,594

NOTE.—The outlay shown under Works includes establishment debitable to Works.

The outlay incurred during the year on works under head "Canals" is the highest of the series; compared with the average of six previous years it is more by Rs. 1,18,909; compared with the preceding year's expenditure it is greater by Rs. 61,756.

The expenditure on works under head "Bunds", on the other hand, is the lowest in the series of years given; compared with the average it is Rs. 45,657 smaller; compared with the previous year's outlay Rs. 16,688 less.

It is worthy of consideration, whether the outlay on protective river embankments should not now be removed from all connection with that on canals. Originally bunds were made here and there for the preservation of certain portions of canal cultivation, and while this was their chief function, expenditure on them was rightly debited to the canal grant. But now these bunds have been extended and improved till they practically protect the whole country, and some change appears necessary in accounting for the cost of their up-keep, so that each interest protected should bear its due share.

25. Statement G (2) following gives the expenditure incurred on works of extensions and improvements for the year under report and for the six preceding years:—

STATEMENT G (2) (*vide* TABLE IV.)

Years.	EXTENSIONS AND IMPROVEMENTS.		
	Works.	Establishment.	Total.
	Rs.	Rs.	Rs.
1883-84	1,40,694	29,107	1,69,801
1884-85	1,51,847	31,040	1,82,887
1885-86	1,28,984	34,257	1,63,241
1886-87	2,00,615	49,647	2,50,262
1887-88	1,67,420	36,676	2,04,096
1888-89	1,32,558	36,451	1,69,009
Average ...	1,53,686	36,196	1,89,882
1889-90	3,18,798	74,504	3,93,302
Difference ...	+1,65,112	+38,308	+2,03,420

It is on works of the nature indicated by the heading of this statement that a more liberal outlay could be most usefully and profitably spent in this Province, and on first inspection it would appear that a step had been taken in this direc-

tion. But an examination of the list of works (given below) on which this apparently large allotment for improvements has been spent, shows that almost half of it (Rs. 1,56,834) was given for, and expended on, works for strengthening the river embankments and increasing the general security of the country. Such works are no doubt necessary and beneficial, but they seem out of place in a report dealing with canal expenditure and revenue, and their inclusion is likely to give an incorrect idea of the former. A complete list of all works under this head follows :—

	Rs.	Rs.
1. Constructing new loop to the Kashmor Bund... ...	1,09,006	
2. Constructing two small bunds	218	
		1,09,224
3. Constructing a stop-gate bridge over the Koraiwah at Baiji in the Rohri districts	2,401	
4. Widening the Deharwah	797	
5. Sukkur-Begari Bund	6	
		3,204
6. Constructing new loop to the Jháli Bund	362	
7. Strengthening Jháli Bund	3,212	
8. Chauki at Fordwah mouth	1,093	
9. Fordwah Regulator	8,030	
10. Excavating new feeder to the Western Nára (Pritchard Canal)	85,961	
11. Constructing sluice over Arthurwah	452	
12. Constructing new loop to Mithu Bund	10,827	
13. Strengthening Saidabad Bund	2,782	
14. Strengthening Mithu Bund	12,953	
15. Strengthening Phulu Bund	9,703	
16. Restoration of the Lashari Bund	798	
17. Constructing new loop to Magsi	121	
		1,36,294
18. Improvements of the Dambrowah	16,914	
19. Improvements of the Renwáh	32,500	
		49,414
20. Shifting the banks of the Mithrau Canal	1,508	
		1,508
21. Extending Hájipur Embankment...	3,857	
22. Constructing two head sluices for private channels crossing Hájipur Bund	1,287	
		5,144
23. Improvements to Upper Nurwah	2,087	
24. Baghar new cut to supply Kára Creek and strengthening Katiwah	4,216	
25. New loop to Kokawari Bund	2,995	
26. Constructing masonry heads to canals passing the left Bank bunds	4,712	
		14,010
Total expenditure under Extensions and Improvements...		3,18,798

It seems unnecessary to add anything to the description of these works that will be found in the Sind Section of the Administration Report of the Presidency, or to that of the following works of improvement on Major and Minor works for which Capital and Revenue Accounts are kept, which is given in the same place:—

MAJOR WORKS.

Desert Canal.

	Rs.
1. Road bridge carrying the Toj-Kandkot road over the Toj Rajwah	640
2. Two road bridges over new fall, Rajwah ...	846
3. Excavation and improvements of the new fall, Bugte and Toj Rajwahs	670
	2,156

EASTERN NA'RA WORKS.

Nára Canal.

		Rs.	Rs.
1.	Closing Jatri openings	3,244	
2.	Strengthening Bedi, Lunar and other bunds	125	
3.	Embankments right bank, Nára, Kipra to head of Thar Canal	2,701	
			6,070

Mithrau Canal.

1.	Raising portion of Jalab Bund ...	2,007	
2.	Constructing small regulator on 7th mile, right bank bund	136	
3.	Constructing an iron road bridge at 28th mile near Sindri	2,768	
4.	Excavating right bank branch commencing in 9th mile	1,762	
5.	Masonry heads to kariahs	1,293	
6.	Protective embankments	405	
			8,371

Dim Canal.

1.	Road bridge and regulator at 18th mile.	410	
2.	Road bridge, 2nd mile	334	
3.	Do. 4th do.	956	
4.	Do. 10th do.	—7	
5.	Do. 11th do.	1,753	
6.	Do. 14th do.	1,294	
7.	Do. 21st do.	391	
8.	Extensions and improvements ...	17,502	
			22,633

Hiranwah Canal.

1.	Additions and alterations to Hiranwah sluice		129

Khipra Canal.

1.	Alteration to head regulator ...	8	
2.	Road bridge, 3rd mile	1,122	
3.	Do. 7th do.	1,105	
4.	Do. 11th do.	1,094	
5.	Tail sluice	840	
6.	Constructing bungalow at Kahi ...	2,057	
7.	Do. out-houses do. ...	458	
8.	Excavation canal	11,023	
			17,707

Thar Canal.

1.	Constructing a road bridge on 2nd mile, right bank branch	450	
2.	Do. do. 4th do. ...	368	
3.	Baulk-houses, 2, on Thar Canal ...	337	
4.	Baulk-house, 1, on Chor branch ...	138	
5.	Darogah's landhi at Umarkot ...	941	
6.	Constructing out-houses to bungalow at Nurwah	6	
7.	Constructing a bungalow at Sufi-jo-Gote.	117	
8.	Masonry kariah heads	1,239	
			3,596

Total, Eastern Nára Works ...	58,506
Add Desert Canal (Begári Districts) ...	2,156
Total, Major Works ...	60,662

	Minor Works.	Rs.
1.	Regulating sluice at head of new Fuleli ...	20,543
2.	Quarters for khalásis do. ...	324
3.	Baulk-shed at do. ...	864
4.	Regulator at head of Kazia	4,631
5.	Head sluice to old Kazia	2,017
6.	Bridge over the old Kazia	1,470
7.	Re-opening the old Kazia	14,137
8.	Excavating escape channel, Sanhi Guni ...	177
9.	Chauki at Nindhoshahr	5
10.	Regulating sluices over kariahs ex-Ghári Mandhar	977
	Total, Minor Works ...Rs.	45,145

26. The following statement contrasts the charges of the year for establishment expenditure and direction with those of previous years as debited to Capital and Revenue and Agricultural Works :—

Statement G (3).

Districts.	Capital Expenditure.									
	1888-89.					1889-90.				
	Outlay.	Establishment Charges.				Outlay.	Establishment Charges.			
		Executive.	Percentage on Outlay.	Direction.	Percentage on Outlay.		Executive.	Percentage on Outlay.	Direction.	Percentage on Outlay.
1	2	3	4	5	6	7	8	9	10	11
	Rs.	Rs.		Rs.		Rs.	Rs.		Rs.	
Begári Canals	31,544	4,732	15·	1,578	5	2,156	324	15	108	5
Eastern Nára	60,808	12,159	20·	3,040	5	58,506	11,701	20	2,025	5
Fuleli Canals	47,000	7,050	15·	2,350	5	45,144	6,772	15	2,257	5
Total ..	1,39,352	23,941	..	6,968	..	1,05,806	18,797	..	5,290	..

Note—No Capital expenditure was incurred in the Shikárpur, Ghár, Hyderabad and Karáchi Canals in both years.

Districts.	Revenue and Agricultural Expenditure.									
	1888-89.					1889-90.				
	Outlay.	Establishment Charges.				Outlay.	Establishment Charges.			
		Executive.	Percentage on Outlay.	Direction.	Percentage on Outlay.		Executive.	Percentage on Outlay.	Direction.	Percentage on Outlay.
1	2	3	4	5	6	7	8	9	10	11
	Rs.	Rs.		Rs.		Rs.	Rs.		Rs.	
Begári Canals	1,20,706	39,893	33·0	6,060	5	2,45,978	48,446	19·7	12,294	5
Shikárpur Canals	68,251	28,937	42·4	3,358	4·9	87,592	25,680	29·3	4,435	5
Ghár Canals	2,36,524	43,099	18·2	11,847	5	2,78,806	36,529	13·1	14,061	5
Eastern Nára Canals	46,891	34,675	73·9	2,359	5	51,352	28,635	55·8	2,668	5
Hyderabad	2,30,590	30,672.	13·3	11,604	5	2,31,254	39,306	17·0	11,702	5
Fuleli Canals	2,02,430	23,582	11·6	10,149	5	2,17,278	23,389	10·7	11,023	5
Karáchi Canals	1,47,615	41,326	28·0	7,332	5	1,72,058	49,012	28·5	8,744	5
Total ..	10,53,007	2,42,187	..	52,709	..	12,84,318	2,50,997	..	64,887	..

These statements show a satisfactory saving in the charges debited to Capital, but a considerable increase in those charged to Revenue and Agricultural. This increase comes under the heads "Engineering" and "Secretariat and Accounts," and in the former case is due to Colonel Twemlow having acted as Superintending Engineer for 70 days, and also to the formation of the late Lower and Central Sind district during the year, for the execution of works of the General Branch which were carried out in the previous year by the

Irrigation districts. The charge in the Eastern Nára district is still high, but a satisfactory decrease is evident.

27. In Statement H. is shown the percentage of expenditure on revenue and the cost of maintenance per acre of cultivation for the year compared with the average of six previous years :—

STATEMENT H (*vide* TABLES III & IV).

Years.	Cultivation.	Total Canal Revenue assessed.	Expenditure.			Percentage of Expenditure on Revenue.	Cost of Maintenance per Acre.
			Maintenance and Repairs.	Revenue Collection.	Total.		
	Acres.	Rs.	Rs.	Rs.	Rs.		
1883-84	1,540,831	33,07,052	10,92,944	2,74,762	13,67,706	41·36	0·88
1884-85	1,783,173	37,73,166	10,67,474	3,36,613	14,04,087	37·21	0·79
1885-86	1,739,919	35,77,341	10,79,672	3,16,215	13,95,887	39·02	0·80
1886-87	1,814,650	37,77,985	10,99,852	3,29,394	14,29,246	37·83	0·80
1887-88	1,871,114	38,78,084	13,02,617	3,42,170	16,44,787	42·4	0·88
1888-89	2,118,635	44,69,436	11,81,720	3,91,630	15,73,350	35·2	0·74
Average	1,811,387	37,97,177	11,37,380	3,31,797	14,69,177	38·69	0·81
1889-90	2,349,819	47,91,745	12,14,558	4,23,904	16,38,462	34·19	0·69

The result of the year's operations, as exhibited in this statement, is most satisfactory. In each case the percentage is the lowest of the series of years represented and shows a fair decrease since last year.

28. The financial results of the irrigation works of the Province are shown in the following statement :—

STATEMENT I.

Class of Works.	Gross Revenue.	Working Expenses.	Net Revenue.	Simple Interest.	Net Profit.
	Rs.	Rs.	Rs.	Rs.	Rs.
Major Works (Productive Works) ...	10,33,706	3,06,699	7,27,007	3,27,492	3,99,515
Minor Works, Irrigation and Navigation, for which Capital and Revenue Accounts are kept ...	12,60,717	5,30,247	7,30,470	...	7,30,470
Minor Works, Irrigation and Navigation, for which only Revenue Accounts are kept	20,67,246	10,20,136	10,47,110	...	10,47,110
1889-90	43,61,669	18,57,082	25,04,587	3,27,492	21,77,095
1888-89	40,49,095	17,03,205	23,45,890	3,23,670	20,22,220
Difference ...	+3,12,574	+1,53,877	+1,58,697	+3,822	+1,54,875

The figures in this statement show an increase of net profit for the year of Rs. 1,54,875 over that gained in the preceding year, which is the more satisfactory in that the profit for the year 1888-89 exceeded that of 1887-88 by the large sum of Rs. 5,99,028. The net profit under the head Minor Works, Irrigation and Navigation, is less than that of previous year by Rs. 70,544, chiefly owing to the large and as yet unprofitable expenditure on the Pritchard Canal, which also in great part accounts for the increase in working expenses. There is also a satisfactory decrease in the deficit against Major Works of Rs. 1,59,018, which gives hopes of its speedy extinction.

29. In the following statement the area irrigated by each of the eleven works for which Capital and Revenue Accounts are kept is contrasted with that of last year, and with the cultivation anticipated from each :—

STATEMENT J.

Canals.	Area irrigable by the complete Project.	Area irrigated during		Excess Area irrigated, Columns 2 and 4.
		1888-89.	1889-90.	
1	2	3	4	5
Major Works.	Acres.	Acres.	Acres.	Acres.
Desert Canal	109,500	113,155	127,579	18,079
Unharwah	18,000	43,172	33,840	15,840
Begári Canal	104,000	201,718	183,479	79,479
Eastern Nára Works	212,631	217,700	285,213	72,582
Total ...	444,131	575,745	630,111	185,980
Minor Works.				
Sukkur Canal	About 600,000	83,770	90,348	151,568
Ghár Canal		211,365	236,097	
Fuleli Canal		288,584	321,222	
Mehrabwah		14,188	15,029	
Alibhar Kacheri		6,853	10,236	
Márak		46,660	52,577	
Sarfrazwah		24,679	26,059	
Total ...	600,000	676,099	751,568	151,568

For the four Major Works there is shown an increase of 54,366 acres, about $\frac{3}{4}$ths of which is due to Eastern Nára and $\frac{1}{4}$th to the Desert Canal, while the Unharwah and Begári Canal both show a decline in area cultivated, as already explained. Under minor works, of which there are seven, the area cultivated has increased by 75,469 acres since 1888-89, due to a better supply from a good inundation and to the development of improvements.

30. The following statement shows the financial results (actual) of the 4 Major Works and 7 Capital Works (Minor) of the Province for the year under review :—

STATEMENT J (1).

Canals.	Capital Outlay to end of 1889-90.	Gross Revenue.				Working Expenses.			Net Revenue.	Deduct average Receipts before Improvements.	Balance or net Revenue due to Capital Expenditure.	Percentage of net Revenue on Capital Outlay.
		Irrigation.		Plantations and Miscellaneous less Refunds.	Total.	Direct.	Indirect.	Total.				
		Government Lands.	Jághir Lands.									
1	2	3	4	5	6	7	8	9	10	11	12	13
Major Works.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Works.												
Desert Canal	12,57,521	1,45,693	51,768	167	1,97,628	51,394	931	52,325	1,45,303	...	1,45,303	11·55
Unharwah	3,39,128	46,651	...	27	46,678	15,766	237	16,003	30,675	...	30,675	9·04
Begári Canal	16,73,079	2,74,698	43,655	388	3,18,741	1,00,695	1,745	1,02,440	2,16,301	24,856	1,91,445	11·44
Eastern Nára Canals	52,37,576	4,81,425	1,830	15,708	4,98,963	1,31,557	4,374	1,35,931	3,63,032	3,444	3,59,588	6·86
Total, Productive ...	85,07,304	9,48,467	97,253	16,290	10,62,010	2,99,412	7,287	3,06,699	7,55,311	28,300	7,27,011	8·54
Minor Works.												
Works for which Capital and Revenue Accounts are kept.												
Sukkur Canal	13,88,713	2,10,888	245	1,577	2,12,710	37,065	506	37,571	1,75,139	71,550	1,03,589	7·46
Ghár Canal	4,40,977	6,40,937	2,205	5,615	6,48,757	1,42,170	3,146	1,45,316	5,03,441	1,16,832	3,86,609	87·67
Mehrabwah	67,869	25,781	1	180	25,962	19,924	417	20,341	5,621	...	5,621	8·28
Alibhar Kacheri Canal ...	23,917	18,275	549	38	18,862	6,019	120	6,139	12,723	8,427	4,296	17·96
Márak	2,01,553	1,00,042	1,838	287	1,02,167	24,545	432	24,977	77,190	36,459	40,731	20·02
Sarfrazwah	1,24,680	35,162	1,885	441	37,488	23,075	492	23,567	13,921	11,155	2,766	2·21
Fuleli Canal	10,81,366	5,62,273	23,159	4,046	5,89,478	2,68,082	4,254	2,72,336	3,17,142	1,30,284	1,86,858	17·27
Total, Minor Works for which Capital and Revenue Accounts are kept	33,29,075	15,93,358	29,882	12,184	16,35,424	5,20,880	9,367	5,30,247	11,05,177	3,74,707	7,30,470	21·93
Total ...	1,18,36,379	25,41,825	1,27,135	28,474	26,97,434	8,20,292	16,654	8,36,946	18,60,488	4,03,007	14,57,481	12·30
Total for 1888-89 ...	1,17,02,029	23,41,817	1,64,085	26,628	25,32,530	8,76,678	24,609	9,01,287	16,31,243	4,03,007	12,28,236	10·49

The percentages of net revenue on Capital outlay on the above works, for the year under review and for the preceding one, are compared as follows :—

Major.	1889-90.	1888-89.
Desert Canal	11·55	12·14
Unharwah	9·04	15·89
Begári Canal	11·44	14·11
Eastern Nára Works	6·86	5·30
	8·54	8·49
Minor.		
Sukkur Canal	7·46	5·63
Ghár Canal	87·67	56·27
Mehrabwah	8·28	7·96
Alibhar Kacheri	17·96	...
Márak	20·02	17·19
Sarfraz	2·21	6·08
Fuleli	17·27	14·54
	21·93	15·65
On Total ...	12·30	10·49

There has been a falling off on the Desert, Unharwah and Begári Canals. On the Desert Canal the falling off appears to be principally due to the increased outlay under head "Working Expenses" which reduced the net revenue. The Eastern Nára works show an increased percentage of 1·56. The total net result, due to this increase, is 8·54 against 8·49 of the preceding year. The earnings of the seven Minor Works during the year were very satisfactory, with the single exception of the Sarfrazwah, in which the increased working expenses reduced the net gain. The percentage of revenue on Capital for the Ghár is remarkable, and that for the Alibhar Kacheri canal shows a great improvement since last year, when there was a balance of Rs. 10,645 due to Capital expenditure on this canal.

31. The mileage of canals and bunds in the year 1889-90 stands at 5,924 and 653 miles respectively, against 5,916 and 613 of the previous year. The mileage of canals in the Fuleli districts and of bunds in the Eastern Nára and Karáchi districts has been readjusted, as that shown in former years was incorrect. The differences are as under :—

	Canals.	Bunds.
1888-89	5,916	613
1889-90	5,924	653
	+8	+40

32. Table VIII. shows the effect of the inundation in the large increased supply in all the canals, but, as was to be expected, only a portion of this increase could be utilized in the time, as is proved by the decrease of duty to be remarked in most of the canals. On the Ghár Canal there is a remarkable decrease in area under jowári of nearly 20,000 acres, and an increase of rice cultivation of 37,000 acres, compared with last year's return.

33. The rainfall for the year was above the average and was general over the Province as shown in Table IX. Last year the greatest fall was registered in the southern districts, while in this, the northern and Hyderabad districts had the largest share. Whether rain is beneficial or otherwise depends on the character of the inundation; in a good year it generally does much harm, while in a bad one it has often saved large areas of cultivation from destruction. In the year under review, although in a few places breaches in canal banks were caused by heavy rain and some damage to crops occurred, its effect was for the most part beneficial, as the heaviest fall happened when the river might with advantage have been somewhat higher.

34. By the lamented death of Mr. G. Lambert, the officer under whose superintendence the operations of the Irrigation Department were controlled

during the year, Government have lost an able and energetic servant, the people a kind and sympathetic friend, and the officers who served under him a considerate and impartial guide.

The following officers were in executive charge of the several districts:—

Mr. T. W. deWinton	...	... Begári Districts.
Mr. D. George ...	...	... Shikárpur do.
Mr. J. Young ...	...	... Ghár do.
Mr. W. L. Cameron	...	... Eastern Nára do.
Mr. R. B. Joyner	...	... Hyderabad do.
Mr. J. R. Hatherly	...	... Fuleli do.
Mr. J. Tate ...	...	... Karáchi do.

BEGÁRI CANALS DISTRICT.

35. *Kashmor Bund.*—The establishment on this bund was reduced early in the season by 150 beldárs and 2 mukádams, and the total length was divided into three subordinate charges, there formerly having been four. Five leaks occurred in the 21st, 23rd and 27th miles, but they were promptly closed. The greatest depth of water against the bund was 9·90′ in the 39th mile, and seeing that this was only the second season in which water had touched this part, it is creditable to the establishment that no leaks occurred. The erosion of the river opposite this portion of the bund continued during the year.

36. *The Desert Canal.*—This canal was opened on 25th May and ceased to flow on the 4th October. The average supply was 2,608 cubic feet per second against 1,871·50 last year. The canal worked well and the returns are satisfactory.

37. *The Muradwah* was opened on 25th May, and ceased flowing on 26th September. The average supply was 65 cubic feet per second in excess of that of previous year, and satisfied all demands.

38. *The Unharwah.*—This canal was also opened on 25th May, and flowed till the 26th September. The supply was good for the first part of the season, but the river cut into the dhund from which it is fed in July, and seriously affected the supply for the rest of the inundation:

39. *The Begári Canal.*—Water was admitted to this canal on 20th May, and full supply on 27th June. The Begári is fed from the same dhund as the Unharwah, and suffered from the same cause, though the average supply was 4,110 cubic feet, as compared with 4,046 of last year. Previous to the failure in the dhund the supply was exceptionally good, but was greatly affected when the river began to fall. The area cultivated was 183,479 acres and the assessed revenue Rs. 3,18,756.

The demand for water from this canal has increased so greatly of late years, that it will be necessary to meet it by the construction of new canals, as it does not seem possible to increase the capacity without destroying its regimen.

The canal ceased to flow on 15th October.

40. The total canal revenue and charges against canals in this district are shown in the following statement:—

Years.	Total Canal Revenue collected (actual.)	Revenue Charges.		Percentage on Maintenance and Revenue Collection.	Percentage of Total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1885-86	4,77,172	1,80,345	1,80,345	37·8	37·8
1886-87	4,44,542	1,79,780	3,06,078	40·4	68·8
1887-88	4,54,979	1,96,853	2,52,249	43·27	55·44
1888-89	6,34,190	2,12,066	2,15,997	33·44	34·05
1889-90	5,67,007	2,12,959	3,52,634	37·55	62·19

The total revenue collected shows a falling off of Rs. 67,183 from that of last year, though it compares favourably with the collection of the other preceding years.

The maintenance and revenue charges are practically the same, and the large increase in the total charges is due to extraordinary expenditure on new loop for Kashmor Bund.

SHIKÁRPUR CANALS.

41. The Sukkur-Begári Bund remained staunch throughout the season, only three unimportant leaks occurring, which were soon closed. Towards the close of the inundation a set of the current began between the 17th and 22nd mile, but there was no other change since last year. In several exposed places the front slope of the bund was much damaged during storms which occurred in July.

42. The Sind canal worked well, as did all others in this district, with the exception of those in Rohri, which were swept over by the Ubauro and Bahawalpur floods. It is noteworthy that this is the first time the last-named flood has appeared since 1878.

43. The following statement shows the revenue collection and the charges for the year under review and those for the four previous years :—

Years.	Total Canal Revenue collected (actual).	Revenue Charges.		Percentage on Maintenance and Revenue collection.	Percentage of Total Charges.
		Maintenance and Revenue collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1885-86	2,88,336	1,44,433	1,78,861	50·1	62·0
1886-87	3,18,769	1,62,045	1,84,627	58·3	57·9
1887-88	3,28,082	1,86,771	2,38,852	53·06	72·80
1888-89	3,60,796	1,16,525	1,36,486	32·30	37·82
1889-90	3,61,663	1,49,635	1,53,957	41·37	42·56

The column for collection shows a satisfactory yearly increase, but the percentages for the year 1889-90 are high owing to increased charge for maintenance and collection.

GHA'R CANALS.

44. In the Saidabad Bund there were five breaches, all of which were closed with more or less trouble. They were due to the fact that the bund had not been saturated for three years. The damage done was slight and fully recouped by rabi crop.

45. *Jhali Bund.*—Water touched this bund throughout its whole length, the pressure being considerably greater in the northern half, reversing the condition that has obtained for several years. There was only slight erosion, and with the exception of a few leaks the bund remained sound.

46. *Mithu Bund.*—There was a great head of water against this bund, and two large breaches occurred which caused the disastrous floods described in a previous part of this report. About 24,000 acres of the kharíf crop were submerged, the railway embankment had to be cut, and the town of Lárkhána narrowly escaped. The breaches could not be closed as all material around was under water.

47. All other bunds in this district stood well, although subjected to an unusual pressure in many places where water had not touched them for years.

48. *Sukkur Canal.*—The Rahuja head of this canal was opened for kharíf on the 7th June, and the full supply of 11·50 was attained on the 28th, or three weeks earlier than in the previous year. This supply was increased as much as

the banks would allow of between the 9th July and 7th September with great advantage to the cultivators, who throughout the season had nothing to complain of regarding water-supply. All the branch canals worked very satisfactorily. The old head was opened for rabi on 10th November, after a large *tooda* that had formed in front had been removed, and it worked well as long as required. From the increased kharíf supply a considerable area of rabi land received its first watering so that water through this head was not required as early as usual.

49. *Ghár Canal.*—This canal was opened on the 23rd May, or nine days earlier than in the previous year. There was no erosion at the mouth, which worked well and did not cease to flow till 11th December, nearly two months later than in previous year. The flood from the breaches in the Mithu Bund crossed the canal in many places, and, flowing west, crossed the Shahjo-kur and Nurwah branches, flooding parts of the Kambar and Nasirabad Tálukas. All branch canals not affected by this flood worked most satisfactorily.

50. *Fordwah.*—This canal takes off from the river and falls into the Ghár at 28th mile. The continued erosion of the river on the mouth necessitated the construction of a new regulator a mile below the old one at the crossing of the Phulu Bund. The river on its first rise cut away 200 feet in one day, and then changed its course, causing no further damage. Another branch of the Mitho flood crossed this canal, doing much damage to the embankments, and, being passed through the railway bank, joined the other branch in the Nasirabad Táluka. Speaking generally, the working of the Ghár and its branches was most satisfactory, and the prospect for the future is encouraging.

51. *Western Nára* was opened on the 18th May under favourable circumstances, the first three miles having been cleared and the mouth being well situated. Much land on the west of this canal was flooded by rain floods from the hills in the Shikárpur and Karáchi Collectorates. In the former the supply was ample, but in Karáchi the usual complaints were rife, and are not likely to cease till the Pritchardwah is in full working order by next inundation. The Nára ceased to flow on the 24th November; all the branch canals were well supplied.

52. The following statement shows the collection and charges for the year and four previous years:—

Years.	Total Canal Revenue collected (actual).	Revenue Charges.		Percentage on Maintenance and Revenue collection.	Percentage of Total Charges.
		Maintenance and Revenue collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1885-86	10,37,602	3,06,686	3,63,637	29·6	35·0
1886-87	10,62,799	2,81,910	3,21,351	26·5	30·2
1887-88	10,49,490	2,94,952	3,18,534	28·10	30·4
1888-89	12,25,682	2,93,772	3,95,128	23·96	32·24
1889-90	13,10,527	2,80,045	4,41,150	19·08	33·65

The figures are satisfactory in every respect, the increase under collection being steady and continuous, and the charge for maintenance decreasing.

EASTERN NÁRA CANALS.

53. *Nara.*—The Nára supply channel not having been closed at all, the supply in the Nára at the commencement of the season was ample. Water fell, however, towards the end of May and beginning of June. This caused no inconvenience on the upper portion, that is, near the Mithrau Canal, but below Tanda Mitha Khán the want of water began to be felt.

54. Towards the middle of June the Indus began to rise rapidly at Sukkur, the supply channel gates were opened out, and by the beginning of July the gauge at the 12th mile of the supply channel read 21 feet. Floods from the Bahawalpur State and the Ubaurao Táluka of the Rohri District came into the

Nára, and on the 24th of July the gauge reading at the 12th mile of the supply channel was 25′ 7″, the highest reading of the year. This is 10 inches lower than the highest in 1882, but in 1882 water remained at a high level for only a few days. It did not reach 20 feet on the gauge till the end of July, and by the 28th of August had fallen to 17′ 8″. This year, however, from the 25th of June to the 13th of September it was constantly over 20 feet. The needles of the head regulator appear to have been difficult to work, and much more water passed through the gates than was wanted. During July the greatest difference between the up and down stream gauges was 5·40. This difference was increased to 8·20 feet on the 20th of August. But the lower gauges reading even then was 13′ 8″ and as on that day the gauge at the 12th mile showed 22′ 7″ of water (which rose on the 27th again to 23′ 7″). The river water was not wanted, the flood water alone being more than sufficient for the requirements of this district.

55. With all this water entering the Nára, the bunds north of Tanda Mitha Khán were soon severely tried, and unprotected land began to be flooded. In spite of this, however, in the southern portion, near Kipra, and in the Thar canal, there were serious complaints of deficiency of water, and it looked as if there would be considerable damage from breaches and floods in one portion and draught in another.

56. Formerly the Nára water passed through what are called the Jatri openings, near Tanda Mitha Khán, and after flooding a large area of land on the east re-entered the Nára channel through the Keti sluice, about six miles north of Kipra. Last year these openings were bunded with the object, partly of throwing open to cultivation about 20,000 acres of land that were always submerged, and partly of allowing the water, which was wasted in filling these hollows, to pass directly down the Nára to the Kipra, Thar and other smaller canals. Unfortunately, however, the Nára channel between the Jatri openings and the Keti sluice is very much silted and choked up with weeds and jungle, and water could not find its way down.

57. It seemed a somewhat serious step to take to cut the Jatri Bund which had been constructed only a few months before, but there appeared no other course open. There was still an enormous quantity of water entering the Nára, bunds above Jatri were bursting, and land was being flooded, and yet further down the people were crying out for water. Accordingly on the 11th August the Jatri Bund was cut. This gave immediate relief and water at the Jatri gauge fell from 11·90 feet on the 11th of August to 8·50 on the 12th.

58. The low lands into which water was thus admitted had fortunately already been submerged by spill water and from breaches in the Bedi, Lunar, and Rebhan Bunds; consequently the water newly admitted was able to pass out into the Nára through the Keti sluice without delay. Up to the time of cutting the Jatri Bund water had been rising at the rate of 0·05 foot a day at the Keti sluice. Immediately after cutting the bund, water of course fell at the sluice, as the Nára was emptied into the low lands to which a passage was now given. On the 11th the gauge reading at Keti (down stream) was 3·85. This fell to 3·35 on the 14th, but then it rose rapidly, standing at 6·70 feet on the 24th, and rising constantly till the 14th of September, when the up and down stream gauges read respectively 8·30 feet and 7·45 feet.

59. Though the water came late and crops had already suffered to some extent, still they had not been irretrievably damaged. There was now not only no complaint of any deficiency, but soon there was more water than the Nára could carry. Unprotected lands were flooded and small bunds, like the Bhopi, Aktali, and Pabnai Bunds, gave way. These bunds are only intended to keep the Nára water from being wasted in a long series of sandy dhands to the east of the Nára where there is no cultivation. They would have been cut if they had not given way to relieve other bunds that protect cultivation.

60. About 22,000 acres of cultivation were submerged by spill water between the Nára and the Mithrau Protective Embrankment, the loss to the cultivators being estimated at about 3½ lákhs of rupees.

About 3,000 or 4,000 were saved by the owners making small bunds round their fields at their own expense. To Government these floods will cause any-

thing but loss. The greater part of the 22,000 acres was cropped with rabi, and for such part no remissions were granted, and a large area of other lands, that was submerged, was cultivated.

61. *Adhwahna and Owad Bunds.*—These bunds are on the left bank of the Nára to the north of the head of the Mithrau Canal and are intended to prevent the Nára water from spreading to the east. They were designed to withstand a pressure of 10 feet of water at the Adhwahna gauge. This year the highest reading was 11·10 feet, and the water rose to this level very rapidly, rising from 8·60 feet to 11·10 feet between the 23rd of July and the 1st of August. That no breach occurred under these trying circumstances reflects great credit on all in charge of the bunds. It would in any case have been a creditable performance to keep up the bund against such a head of water, but combined with this there was the rapid rise.

62. *Rata Bund.*—This bund is on the right bank of the Nára in the territory of His Highness the Mir of Khairpur. It protects from floods lands on the Dimwah and to the west of the Mithrau Canal. It is made of sand and was considerably damaged by scour. To check this as far as possible brushwood groynes were constructed during the inundation. In spite of this, in one part the whole of the bund, but the rear slope, was carried away. Small bunds were also put on top of the bund, in parts where the sand had been blown away from the crest, and water was thus prevented from topping it.

No breach occurred in the bund itself which is highly creditable to the men in charge seeing that the water-level was only 0·30 foot below the flood-level of 1878. Two sluices, however, one in the Sariah Sang and one in the Rata Sang, which had been constructed to supply water principally to His Highness the Mir's shooting grounds, were carried away. The water escaping from the breaches so made did no damage beyond raising the flood-level against the Jalab Bund which checked its advance.

63. *Jalab Bund.*—This bund also remained staunch, though it was somewhat severely tried. In parts the crest was only 2 feet above the flood level, and in others, where the soil is sandy the bund had become worn down, and it was found necessary to construct small bunds in such places to prevent the flood water topping the bund. A short distance beyond the end of the bund is a depression called the Mochin Waro Sang. Water estimated at 1,500 feet per second flowed through this depression during the height of the flood. It is proposed to close this before the next inundation and to raise the crest of the bund to a height of 3 feet above this year's flood-level wherever it may be less than that height.

64. One of the rear wing walls of the head regulator of the Heranwah, which crosses this bund in the 4th mile, gave way. Fortunately this was not followed by a breach in the bund itself.

65. *Makhi Bund.*—This bund starts from the head regulator of the Mithrau Canal and proceeds to the weir across the Nára below the Makhi Dhand. As water was dammed up to a dangerous level against the Jalab Bund, four breaches were cut in the Makhi Bund. The bund would have been breached in any case, for the flood passed over the top of it in parts of the 3rd and 4th miles. Breaches might then have occurred in parts where it would be difficult, if not impossible, to stop the flow, towards the end of the kharíf season. Cuts were therefore made in high land through which the superfluous flood water could pass, but in which water would dry before it fell to the level required for the Mithrau Canal crops.

66. *Bhaiti Bund.*—The construction of this bund was commenced by the Nára Jail gang in June. They worked until August when they were driven away by the floods, the work being left in an incomplete state. A breach, 160 feet wide, occurred in the portion at which they had been at work.

No attempt was made to close this breach, as that would have entailed only needless expenditure of money, for water passing through it merely joined the general Nára spill, and did no special damage. Efforts were, therefore, made simply to protect the sides and prevent the breach widening.

67. *Mithrau Protective Embankment.*—The Nára spill touched this bund from the 34th to the 37th mile. The depth of water against it was not more than about 3 feet; still a good many leaks occurred which were however stopped.

68. *Dim Canal.*—In 1888-89 this canal was widened and lengthened to supply lands lying to the south, which formerly obtained a scant supply of water from the tails of Indus canals. Owing to this work being in progress water was not admitted into the canal until the 11th of June. The Dim Canal, as it originally existed, irrigated about 3,000 acres a year. Under the new project it is supposed to irrigate 16,000 acres. This year 9,327 acres were irrigated. Still the working of the canal was anything but satisfactory. In August it was much choked up with weeds which seemed to grow as fast as they were pulled out. The result was—the supply fell short, and there were constant complaints of want of water.

Spill water from the Mochin Waro Sang near the tail of the Jalab Bund stood against the right bank of the canal from the 1st to the 6th mile. Some of the crops were saved by means of small bunds thrown up round the fields by the cultivators, but about 200 acres were submerged.

69. *Mithrau Canal.*—Water was admitted into the canal on the 17th of May when the up stream gauge reading was 8·35. Water fell until the 2nd of June when the reading was 4·40. This however was sufficient for the early requirements; after this water rose steadily till the 11th of August, when it reached the greatest height of this year, namely, 14·10. This is the highest recorded since 1878, and is only 0·45 below the highest of that year. The supply in the canal was gradually increased to keep with the demand for water, and in the middle of September the depth admitted was 8·30, the greatest of the year. The spill water from the Nára, and the floods passing through the openings cut in the Makhi Bund, pressed heavily against the first six miles during the whole of August and the greater part of September. The whole of the berm and a portion of the embankment has been scoured away by the canal water in parts along this length, and there was great danger that the flood water would have burst into the canal. The Mithrau Canal in general worked satisfactorily, but there was some deficiency at the tail of the Samara branch, owing to silt which will be removed before next kharíf season. The right and left bank branches 9th mile gave some trouble owing to weeds. Endeavours were made to keep these down.

70. *Khipra Canal.*—This is the first year this canal has been under our management. It is to be extended to Kalu, 14¾ miles, by which a large area of fresh land will be brought under command, and if only the canal can be kept free from weeds, there ought to be a large increase of revenue. There is only clear water available, and the present canal gets much choked up with weeds. Owing to the causes mentioned in the first part of the report of this district, water did not come into the Kipra Canal until very late. Until the middle of June there was no water entering the canal. It came in on the 16th of that month, but then the depth was only 0·40 in the deepened part of the sluice. It was then still over a foot below the original pavement level. Water rose very slowly and on the 11th of August; the depth of water in the lowest part of the regulator was not more than 4·20, *i. e.*, 1·70 feet above the original pavement level. On that day the Jatri Bund was cut and very soon water began to rise rapidly at Khipra, and on the 31st of August there was 8·55′ of water against the regulator. This rose to 9·25 (the highest of this year) on the 14th of September. The greatest depth admitted into the canal was 7·90′. Owing to the water coming so late the kharíf crops did not do well. There were about 5,000 acres of cultivation altogether and of this about 2,000 were submerged by the Nára spill. The greater part of this at all events will be cropped with rabi.

71. *Thar Canal.*—The late arrival of the water gave rise to considerable anxiety on this canal. It was opened on the 29th of May and at first the prospect was good, for on the 1st of June the depth of water against the regulator was 6·25′, which was considerably more than was required for cultivation at that time. But as the demand increased, the supply on the Nára fell, and on the 15th of June the gauge reading was only 4·05′ against 7·40′ on the same date in

1888. After this water increased but slowly, and it was not until the beginning of August that the supply was sufficient for requirements. On the 6th of that month the up and down stream gauges read 8·45′ and 8·30′ respectively. The greatest depth of water against the regulator was 9·70′ (on the 20th of September) and the greatest depth admitted into the canal was 9·45′.

72. The land in the lower portion of the *Nurwah* is eminently suited for dry crops. There is no salt and the soil looks good. But in spite of this, and in spite of the fact that the supply in the canal nearly always falls short, the people continue to grow rice. The cultivation of rice, as practised in this district, means a good lazy kind of way of getting a livelihood. The land is ploughed and when the water comes the seed is scattered broad-cast (here they don't even take the trouble to make seed beds and transplant the rice). Water is then turned on and nature is allowed to do the rest. There is no danger to be feared from locusts, and when the grain is ripening it is not necessary to employ men to drive off the birds. With all these advantages in its favour it is not to be wondered at that the people are loth to take up other cultivation to any very large extent.

73. *General.*—On the whole this has been a very good year for Government. The cultivators, however, have everywhere suffered some loss from some cause or other. In parts of the Nára, in the Khipra Canal and in the Thar Canal water came late. Again on the Nára a large area of kharíf was submerged, and everywhere considerable damage was done by locusts. Swarm after swarm came into the district from the sand-hills and all the cotton, jowári and bájri were damaged to a greater or less extent by them. The rabi, however, ought to be some set-off against these losses.

74. The financial results and the charges against revenue of the Eastern Nára districts are shown in the statement below :—

Years.	Total Canal Revenue collected.	Revenue Charges.		Percentage on Maintenance and Revenue collection.	Percentage of Total Charges.
		Maintenance and Revenue collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1885-86	2,35,204	87,327	87,327	37·1	37·1
1886-87	2,75,293	91,036	91,036	33·06	33·06
1887-88	3,31,680	87,063	87,063	23·23	23·23
1888-89	4,05,787	1,23,600	1,23,600	30·46	30·46
1889-90	4,98,950	1,29,132	1,31,557	25·88	26·36

The total revenue collected in the year under review is very satisfactory; compared with the previous year the increase is Rs. 90,163, and compared with the other preceding years the increase is considerable. The excess on the charges is due to increased outlay on works and increased debit for revenue collection. The percentages show favourable results.

HYDERABAD CANALS.

75. The inundation of 1889 was very favourable compared to that of several previous years, owing to the steady rise in river from the time the canals were opened to the end of the season when the water definitely fell. The occasional fall in river in the middle of the season, although so slight as not to be considered sufficient to affect the supply to cultivators, has one disastrous effect on the inundation canals, *viz.*, of allowing the silt to settle. This silt, once deposited, is not carried away by any subsequent rise of water and the later prospects of the season suffer.

The date of opening the canals should not therefore be fixed arbitrarily simply to meet the consideration of encouraging cultivators or finding drinking water for them. A few days' earlier opening without regard to the state of rise in river or sufficient head of water at canal mouths, may often become the cause

of early silt deposit, the clearance money will have been mostly thrown away and no degree of subsequent rise will much better the prospects, as failure is sure to occur at the end of the season.

76. The set of the current of river towards the left bank affected the canals in this district in two places :—

(*a*). The first was near Wahur from which Mehrab, Nasrat and Naolakhi take off, resulting in the "Lundi" flood. This flood threw an extra quantity of water into the three canals, breaching them in several places.

Mehrab breached near Kotri where it crosses Halani Dharo. Till this breach was closed on 24th July, very little water flowed towards the tail for nearly three weeks. The closing of this breach was very difficult and cost much money. Nasrat sent its extra water into its main branch Fatima, which had several breaches. The Nasrat itself had a small breach near Lakha, but all these were closed in time. The swelling of Naolakhi was serious as it threatened to overflow the town of Tháru Sháh, when a breach a little above the town occurred, which relieved it. The water from this breach found its way through a "Dhora" to Vehri, the continuation of new Dambro.

(*b*). The second place was at the 6th mile of the Sarfraz, which was cut into by the river. There were small breaches in Gharo Rano and Gharo Gahote, but these were all closed at once.

77. The prospects of the season were very good with regard to the extent as well as the outturn of cultivation, notwithstanding some slight injury by locusts and other insects. The kinds of crops in this district are jowári, bájri, til, hemp, indigo, tobacco and cotton. The latter is greatly sown in southern tálukas.

Naushahro Sub-Division.

78. *Mehrab* had in the beginning a breach, thus compelling the cultivators to postpone much of their cultivation. This late cultivation suffered as the canal ceased to flow on 26th September.

Nasrat and its branches.—This was (next to Dadwah) the best supplied canal. Slight damage was caused by the breaches in Fatima.

Naolakhi had a very good supply but yet the cultivators on its tail branches, Bag and Murad, complained about deficiency of water. The canal cannot, without increased capacity, meet the large increasing area of cultivation.

Bhur, large, and Bhorti.—Although owing to their higher beds these canals commenced flowing late and ceased early, no hardship was felt owing to the land on them being low and thus requiring less water.

Sákrand Sub-Division.

79. *Dambrowah.*—This canal had a new mouth dug to it at a cost of Rs. 27,714. The small area on the left of the new cut formerly irrigated by flow from Naolakhi is now changed to lift. Partly to the eroding action of Tagar-Wahur, from which the new head is taken, but chiefly to the breached water of Naolakhi meeting Dambro water in Vehri, the new cut has greatly silted up. Notwithstanding this the supply was excellent, and resulted in increased cultivation.

Dadwah and branches.—The best supplied canal in the whole district. It was flowing late in October, has no silt and no breaches. Its tail, partly widened last year, requires further widening.

Other canals.—"Godaro."—This is sufficiently supplied since the dam across Malak Dhand was made. The supply was further increased last year by closing the Gharo which drains the Dhand. This had the effect of changing some of the lift land to "flow."

Suratwah.—Owing to the frequent failure of its Wahur mouth, this canal was last year supplied from Dadwah through Suhagin, of which it should be considered a branch in future. Suhagin will require widening before long for its own supply and that of Surat fully.

Hala Sub-Division.

80. *Renwah.*—Owing to Nasri lake taking much time to fill, this canal did not flow till 19th June. A dam was constructed across "Gharo", draining the "Dhand" and had the effect of retaining water and allowing the Ren to flow till after 10th October, which was a great help to those who commenced sowing late. Renwah was widened in a few places and its feeder (Gharo Alibahar Myle) was cleared for the first time last year.

Tando Sub-Division.

81. *Nasir.*—Its mouth was changed from "Dhand" to "Gharo" Mahamuda, owing to its not getting good supply in the beginning; both its mouths were allowed to run and the supply was then sufficient.

Sarfraz.—The river cut into this canal at the 6th mile, thus depriving it of the "Dhand" water and giving it a precarious supply. As the river was throwing silt into the canal, even this supply could not be depended upon at the end of the season. A new channel was, therefore, dug with the help of the prisoners at a cost of Rs. 5,253. This is being widened this year and made a permanent portion of the canal. Had not timely arrangements been made for this canal, no cultivation would have been commenced on it through fear of the supply failing at the end of the season, besides the loss of nearly the whole revenue and great hardships to private individuals.

Sangro, Alibahar and Ghalu worked satisfactorily. Their supply was abundant except in Bhumphar and Jarwar, two branches of Ghalu, where complaints for a short time through local causes were made.

82. The total of revenue collected and the charges against revenue in Hyderabad Canals District are given in following statement:—

Year.	Total Canal Revenue collected.	Revenue Charges.		Percentage on Maintenance and Revenue collection.	Percentage of Total Charges
		Maintenance and Revenue collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1885-86	6,18,608	2,08,670	2,11,177	33·7	34·1
1886-87	6,27,340	2,33,164	2,33,164	37·1	37·1
1887-88	6,40,454	2,37,242	2,37,288	37·04	37·05
1888-89	6,93,687	3,24,064	3,36,922	46·72	48·57
1889-90	7,50,917	2,91,483	3,52,147	38·82	46·89

In this district also the financial results as shown above are excellent and encouraging.

FULELI CANALS.

83. All canals were cleared during the cold season to a depth equal to or more than usual but not down to bed-stones. It is not financially possible to clear all canals down to their bed-stones, nor is it desirable to do so. As the special repairs and works executed have had important results on the revenue, some remarks on them appear called for:—

(*a*). First in importance is the new head regulator, built from original works grant, and which was commenced and completed during the season. It was partially closed continuously from the 10th August until the 2nd September, an average depth of about 2 feet of water being cut off. As there was heavy rain in the lower part of the district, a full supply would have caused many more breaches than actually took place, had there been no means of reducing the quantity of water entering the canal. On the other hand by reducing the water level the supply in the Dero Mohbat Táluka was reduced, which is to be regretted as it is always deficient in this

táluka, owing to the relative high level of the land compared with the water level in the canal. Cost Rs. 64,497 exclusive of liabilities to be paid.

(*b*). Next in importance ranks the clearance done by convict labour to a silted disused channel of the Old Fuleli near the site of the Battle of Miani. By clearing this channel a long loop of the Old Fuleli, 3 miles long, has been replaced by a short length of 1 mile, the result has been again of 1 foot in depth in all canals irrigating the Hyderabad Táluka. It has been estimated that this additional height is sufficient to give water to at least 15 per cent. more land than formerly, but as this táluka was suffering from the short length during which the canals flowed, the improved supply was no doubt partly used in improving cultivation already in existence. Cost Rs. 16,824.

(*d*). The next work was undertaken at the mouth of the Mubarakwah, where a very sharp bend in the main canal caused a whirlpool which increased the solid matter beld in suspension in the water, and thus caused undue silting in the branch canal. The silt bank on the concave side was cut away, and used to fill in the convex side, and the filling was protected from scouring action by dry-stone pitching, the result has been that the Mubarak Canal, which usually silts 3′ 3″ above bed-stones at head, silted only 2′ 3″, and therefore it carried a better supply which lasted longer than usual, and it will cost less to clear during the coming season. Cost Rs. 2,935.

(*e*). Finally heavy clearance was done to the Guni, large. The result has been to increase its discharging capacity and thus to augment the quantity of water to be disposed of by the branches of Fuleli in Badin which act as escapes. The discharge of the Guni, large, could have been increased to the same extent by increasing its velocity as by increasing its area, with this difference that the first means would have given a permanent increase of discharging capacity at a cost of Rs. 11,523 for straightening two bad bends, whereas increasing the area by clearance cost Rs. 46,834, and as the causes creating silt (*i. e.* the sharp bends) have not been removed, the improvements, if any, will require annual expenditure to maintain.

84. The special features of the inundation under report are—

1st.—An unusually early and regular rise in the Indus river, giving a very steady, good and unusually long and favourable supply to all canals.

2nd.—A permanent improvement in the carrying capacity of all canals in táluka Hyderabad due to the improvement in aligument of Old Fuleli.

3rd.—A very heavy rainfall on the 12th July in táluka Tando Bago and amounting to 6·63 inches in a single day, causing many breaches in canals on that and the next few days which were as unavoidable as would be damaged by an earthquake.

4th.—A very heavy spill from the river Indus in front of the two hills known as Budhka Takkar. This spill eventually took the form of a river, 1,200 feet wide and 18 feet deep, at the deepest part. It occurred at a part of the river unprotected by river embankments.

5th.—An increase in the number of breaches from branch canals used as escapes, due to the extra work they were called on to do in consequence of the heavy clearance done to Guni, large, and also partly to the reductions ordered in the Abkaláni or inspection establishment.

The breaches in Fuleli and branches due to rainfall were 43 in number and cost Rs. 847 to close; other breaches numbered 104 and cost Rs. 1,377 to close.

85. About 20,000 acres of cultivation were destroyed by flooding from the Budh-ka-Takkar flood, the revenue from which is equal to about Rs. 50,000. This represents a heavy immediate loss to the cultivators and Zamindárs, but the flood will enable them to raise very heavy rabi crops and must have done immense good to the large areas of waste salt lands by removing much of their surface salt, so that the people generally have received some benefit as a set-off to the injury the flood has caused them.

86. The results of the last three years are so favourable as to justify larger expenditure on special repairs having for object the increase of the discharging capacity of canals by increasing their velocity and thereby decreasing the extent to which they annually silt.

87. The financial results and the charges against revenue in the Fuleli District are shown in the following statement:—

Years.	Total Canal Revenue Collection.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1885-86	4,33,198	2,08,605	2,08,654	48·2	48·2
1886-87	5,07,009	2,14,374	2,14,374	42·2	42·2
1887-88	5,54,389	2,76,408	2,76,408	49·86	49·86
1888-89	5,86,517	2,81,063	2,81,063	47·92	47·92
1889-90	6,45,166	2,96,778	3,02,749	46·00	46·92

The collection in the year under review is best of the series of years given, the increase over that of the preceding year being Rs. 58,649. The total charges are in excess of those of previous years, owing to increased outlay on works and increased collection.

KARÁCHI CANALS.

88. The *Manchar lake* filled up well, partly owing to the construction of bunds across the Chario Wahur and old Aral, which forced the water entering by the former into it, and prevented its escape into the river below Sehwan, and partly to the rain floods from the hills in the west. As soon as the river commenced to fall, the bunds were cut and every effort made to encourage the discharge of the water so as to dry the lands surrounding the lake and made them fit for the plough. The result was that a very large area was cultivated. The Zamindárs of course complained that the water was not drained away fast enough, but this is no new thing, and in fact they will never be satisfied till the Manchar is filled to a maximum height during the inundation and drained dry by the beginning of December, which is impossible.

89. The *Upper Nurwah*, which had been enlarged during the working season, gave too large a supply which had to be checked in a makeshift way by a brushwood weir at the mouth. Some breaches occurred, but no great damage was done and no remissions rendered necessary. There was a large increase in area cultivated and revenue derived therefrom.

90. The *Phitta* and *Kolal Siyal* had a fair supply, but their mouths are badly situated and silted heavily. Owing to the high inundation, however, there were no very great complaints.

91. The *Kalri* commenced to flow rather late, owing to a heavy silt deposit in its head and the lowness of the river in the beginning of the season. Some of its branches, especially those near Tatta, got a late supply. Speaking generally, however, and in comparison with previous years it may be said to have worked well. It could no doubt be very much improved by cutting off bends and by other works, but there is some doubt whether the returns would justiy the expenditure.

92. The *Baghar* is really a branch of the river, and flows throughout the year unless in very low seasons. It had too great a supply in the inundation under report, and many breaches occurred in its banks, also in many places where no banks have been found necessary for years, overflow occurred.

93. *Kharira creek.*—This is an old channel into which a cut was made from the Baghar during the working season. Owing to the Zamindárs not being willing to pay occupancy right for the land, none was cultivated, though water was available. Considerable areas have, however, been now taken up.

94. *Minor canals.*—The crops on the Sian in Ghorábári were considerably injured by spill from the Haidari, which is not embanked. The other small canals worked fairly well.

95. *River bunds.*—Owing to the extremely high inundation six breaches occurred in the right bank bunds: in Hilaia bund one: Chach Sumarki bund three, and in Marho bund two. All, except one in Chach Sumarki bund, and one in Marho bund, were closed. It was found impossible, though strenuous efforts were made, to close these and they had to be left to flow. Considerable damage was done. All the breaches, with the exception of that in the Hilaia bund, occurred at sluices. These sluices are the weak points, and without a very large Abkaláni establishment it is impossible to watch them properly.

96. The *Pinyári* with its branches constitutes the largest system of canals in this charge. It flowed throughout the year. As the river rose the head regulator was closed and as much water as possible shut out. On May 1st some needles were removed and from that date onwards the supply was regulated as found necessary. There was an ample supply throughout the season, and had it not been for damage caused by floods, the increase in revenue would have been very large. The only complaints of want of water were from the Zamindárs in Jati, whose cultivation depends on the Gungro, the tail of the Pinyári. As much water as possible was let down, but the danger of breaches in the centre part of the main canal (Shorwah and Achchandan) renders it impossible to give the Jati men as much water as they would like. Later on in the season, when the flood from the Budh-ka-Takkar breach entered the Gungro they had too much water. There were many small breaches on the branches of the Pinyári which cannot be prevented till proper sluices are built at the heads of all dangerous kariahs.

97. The minor canals in the Sháhbandar Sub-division had all an ample supply, and there would have been a large increase of cultivation had it not been for the breaches in the river bunds mentioned below:—

1. Mulchand Bund	...	...	...	One.
2. Jurar Bund ...	...	...	...	„
3. Kadi Bund ...	...	...	...	„
4. Hudirani Bund	...	...	...	„
5. Surjani Bund	...	...	...	„
6. Chaksand Bund	...	...	...	„
7. Uplanki Bund	...	...	...	„
8. Kokawari Bund	...	...	...	„

No. 1 was closed at once and caused no damage. The flood from No. 8 crossed an uncultivated part of the country and did no damage. No attempt was made to close it. The water from Nos. 2 and 3 joined with the water which overtopped the embanked portion between the two bunds, and the breaches widened so rapidly that all attempts to close them failed. The damage done was about Rs. 3,000. Strenuous efforts were made with the assistance of the Revenue officials to close breaches Nos. 4, 5, 6 and 7, but though the water in some of them was actually shut off for a time, yet the juck work, &c., again gave way, and they had all finally to be abandoned. Nos. 4, 5 and 6 all occurred at sluices. No. 4, which did most damage, was at a forest sluice. The other two were at Zamindári sluices, one of which was a very old one, built of brick and mud. Nos. 7 and 8 were ordinary leaks which got out of control. In this sub-division as in Jhirak, the breaches that did most damage occurred at sluices. The river also appears to be setting more and more against these bunds, as it is found that at most of the points where gauges have been fixed, the readings in 1889 were from one to two feet higher than in any previous year.

98. *Budhka flood.*—A very large breach occurred in the river bank in the Fuleli Canals district, nearly opposite Jhirak. The water from this breach swept over the lower part of the Guni Táluka of the Hydearabad Collectorate, and eventually found its way into this district near Mirpur Batoro. The water entered the Gungro and raised the level so much that it escaped all over the country and swept through the cultivation down to the sea. Near Mirpur Batoro bunds were hastily thrown up by Zamindárs and canal and kariah banks strengthened so as to minimize the danger. In other parts where bájri

crops were flooded, they were of course destroyed, but the rice crop in most places was high enough to recover.

99. *Erosion.*—The river cut in very rapidly near a portion of the Kokowari bund. A loop bund was sanctioned and completed just as the old bund was carried away. The erosion at the Khamria bund north of Jhirak continued, but not so fast as to render any immediate action necessary. The river continued to cut in towards the Uplanki bund near Bahadipur, left bank, and towards the Bhiman bund near Kotri Alla Rakio Shah, right bank. No action was necessary during the inundation, but loops have now been sanctioned and constructed.

100. The financial results and charges in this district are shown in the following statement:—

Years.	Total Revenue collected.	Revenue Charges.		Percentage of Maintenance and Revenue Collection.	Percentage of total Charges.
		Maintenance and Revenue Collection.	Total Charges against Revenue.		
	Rs.	Rs.	Rs.		
1885-86	5,41,894	2,59,772	3,29,127	47·9	60·7
1886-87	5,62,169	2,66,937	3,28,878	47·4	58·5
1887-88	5,44,789	3,64,498	4,37,489	66·80	80·30
1888-89	5,52,294	2,22,260	2,53,163	36·62	45·84
1889-90	6,29,743	2,78,430	2,97,570	44·21	47·25

This district also shows very satisfactory results as regards the total revenue collected, the increase compared with the previous year being Rs. 77,449. The charges are in excess of those of the preceding year, owing to increased outlay on works and increased revenue collection.

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

Camp Badra, 24th December 1890.

TABLE I.

Cultivation and Water-share of Net Consolidated Revenue for 1889-90 and three previous years.

Canals and Districts.	1886-87.		1887-88.		1888-89.		Average.		1889-90.	
	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.	Area.	Revenue.
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
Begári Canals.. Desert Canal ...	39,568	65,811	50,107	80,722	69,175	1,24,214	52,950	93,082	82,777	1,48,221
Unharwah ...	24,322	43,773	29,406	53,155	43,172	79,195	32,300	58,708	33,840	59,971
Begári Canal ...	135,066	2,51,196	126,237	2,30,789	163,264	3,10,119	141,522	2,64,034	141,533	2,75,101
Kashmor Bund ...	5,269	9,652	3,840	6,958	3,625	6,634	4,245	7,748	5,363	9,954
Shikárpur Canals. Canals in Rohri ...	65,598	1,62,327	76,634	1,88,096	82,078	2,03,550	74,770	1,84,658	72,698	1,81,952
Bunds in Rohri ...	...	...	...	...	...	...	...	...	...	...
Sind Canal ...	53,025	1,46,036	48,912	1,34,377	55,055	1,51,586	52,331	1,43,999	63,645	1,74,210
Sukkur Begári Bund ...	...	...	...	...	...	...	...	...	...	...
Ghár Canals ... Sukkur Canal ...	66,204	1,61,967	70,721	1,68,122	82,673	1,95,914	73,199	1,75,334	88,287	2,10,821
Ghár Canal ...	170,300	4,79,818	162,960	4,56,605	204,388	5,86,184	179,216	5,07,536	227,555	6,42,041
Nára ...	123,668	3,70,959	127,008	3,80,867	131,168	4,02,556	127,282	3,84,704	151,325	4,18,924
Wáhur ...	6,936	16,071	6,519	15,847	6,166	15,570	6,540	16,029	6,727	16,789
Marvi ...	3,816	10,021	3,689	9,503	4,102	10,406	3,869	9,977	4,138	10,712
Bunds, right bank ...	87	147	113	175	55	95	85	139	...	...
Eastern Nára ... Nára Supply Channel ...	1,683	4,334	2,462	6,238	3,038	7,683	2,394	6,085	6,723	16,442
Eastern Nára ...	18,438	26,704	24,760	34,837	33,307	52,003	27,168	37,848	86,094	1,08,001
Mithrau Canal ...	87,707	1,74,587	104,992	2,05,587	121,839	2,34,776	104,846	2,04,983	122,171	2,40,675
Dimwah... ...	2,269	3,832	2,571	4,159	3,149	5,310	2,663	4,434	9,327	16,939
Heranwah ...	703	1,175	1,575	2,629	2,500	4,289	1,594	2,698	2,444	4,455
Kipra Canal ...	...	...	...	...	...	...	...	...	6,122	7,672
Thar Canal ...	22,389	45,918	31,785	62,352	44,867	85,153	33,013	64,474	48,772	90,504
Hyderabad Canals. Mehrabwah ...	11,858	21,110	12,732	23,181	14,100	26,078	12,897	23,456	14,803	25,548
Nasrat ...	17,607	41,876	18,707	44,760	22,638	53,202	19,671	46,613	25,671	59,266
Naolakhi ...	46,018	1,01,022	48,853	1,07,778	51,058	1,14,691	48,043	1,07,830	52,753	1,16,927
Dambro ...	6,872	14,597	7,128	15,172	7,449	16,412	7,150	15,394	9,506	20,206
Dadwah...	20,637	43,011	22,651	45,819	24,925	52,464	22,738	47,098	26,366	54,291
Renwah...	19,193	35,834	14,908	29,335	13,843	26,490	16,011	30,553	14,150	27,542
Alibhar Kacheri ...	6,473	13,298	5,729	12,206	5,958	12,371	6,056	12,625	8,898	18,195
Márak ...	30,295	80,656	35,708	78,885	40,744	88,508	37,582	82,616	45,897	99,840
Gharo Mahmuda ...	46,115	86,741	45,023	91,282	48,938	97,091	46,692	91,705	55,202	1,12,178
Kari Shumali ...	28,305	37,805	28,604	40,434	34,416	46,661	30,442	41,633	36,078	51,010
Nasirwah ...	25,730	43,401	26,431	47,875	27,570	49,410	26,677	46,895	28,208	52,362
Sarfrazwah ...	19,441	28,598	18,004	28,087	19,530	32,748	18,992	30,111	20,756	34,980
Other canals ...	26,023	52,103	23,076	48,333	22,901	48,584	23,666	49,673	26,937	56,940
Fuleli Canals ... Fuleli ...	199,157	4,36,882	220,540	4,88,618	234,577	5,03,261	218,091	4,76,254	267,732	5,61,087
Other canals ...	15,109	37,300	16,520	40,539	17,917	43,458	16,515	40,432	31,184	55,453
Karáchi Canals. Nára ...	72,368	1,62,905	55,957	1,28,451	56,066	1,18,230	61,464	1,36,529	70,758	1,55,482
Phitta ...	4,872	9,642	5,282	10,130	4,715	9,043	4,956	9,605	5,532	11,018
Canals north of Kotri ...	13,385	25,581	14,354	28,154	14,410	28,089	14,050	27,275	17,770	35,882
Kalri ...	9,122	20,430	8,359	20,831	10,660	22,364	9,380	21,375	11,748	24,616
Baghar ...	17,285	20,569	16,361	29,273	18,867	38,715	17,505	32,519	22,851	48,381
Uchita ...	10,742	26,462	10,527	25,433	10,335	19,211	10,535	23,699	9,980	19,366
Canals in Tatta, &c. ...	9,502	17,515	7,566	12,289	11,374	19,839	9,481	16,548	10,480	18,014
Shal Canal ...	2,814	6,878	2,793	7,107	3,021	6,494	2,876	6,826	2,965	7,498
Pinyári ...	57,137	1,41,772	65,803	1,59,341	66,928	1,69,268	63,289	1,56,794	77,948	1,66,658
Canals in Mirpur Batoro ...	10,068	24,409	10,845	27,385	13,898	32,569	11,604	28,120	17,743	37,415
Canals in Sujáwal ...	7,028	16,410	6,478	14,942	6,868	17,183	6,701	16,178	7,861	13,304
Satta ...	7,041	18,011	9,279	18,438	8,558	17,327	8,293	17,925	9,543	18,317
Canals in Jati ...	1,288	3,263	2,233	5,554	2,122	5,723	1,881	4,850	2,051	4,784
Khanta ...	5,000	9,545	5,222	12,439	4,632	11,325	4,951	11,119	5,003	11,767
Kokawari ...	11,797	22,000	12,050	24,052	8,211	19,776	10,686	21,943	12,345	28,290
Canals in Shahbandar ...	2,541	4,124	1,463	3,400	1,406	3,370	1,803	3,632	1,694	3,931
Bunds, left bank ...	...	...	...	...	...	...	...	...	...	...
Bunds, right bank ...	790	2,326	...	...	...	...	263	775	...	...
Begári Canals...	204,225	3,69,932	209,590	3,80,624	279,236	5,20,162	231,017	4,23,572	263,513	4,93,247
Shikárpur Canals	118,623	3,08,363	126,546	3,22,473	137,133	3,55,136	127,101	3,28,657	136,343	3,56,162
Ghár Canals ...	371,011	10,39,583	371,010	10,31,119	428,552	12,10,725	390,191	10,93,809	478,032	12,99,287
Eastern Nára Canals ...	133,189	2,56,550	168,145	3,15,802	213,700	3,80,214	171,678	3,20,522	281,653	4,84,068
Hyderabad Canals ...	309,572	6,00,052	307,704	6,13,847	334,370	6,64,710	317,216	6,26,203	365,225	7,29,285
Fuleli Canals ...	214,266	4,74,182	237,080	5,29,157	252,494	5,46,719	234,606	5,16,686	298,516	6,16,540
Karáchi Canals	242,780	5,40,837	234,572	5,27,269	242,071	5,39,031	239,808	5,35,712	286,122	6,04,723
Total ...	1,593,666	35,89,499	1,653,627	37,20,291	1,887,556	42,25,697	1,711,617	38,45,161	2,109,804	45,33,932

Note.—The figures in this statement are based on assessments.

TABLE II.

Area of Cultivation and Canal Revenue for 1889-90 and five previous years.

Years.	Cultivation.			Water share of net consolidated Revenue.	Hakába.	Miscellaneous.	Total Canal Revenue.
	Government.	Jághir.	Total.				
	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1884-85 ...	1,586,279	196,894	1,783,173	36,16,370	1,06,090	50,706	37,73,166
1885-86 ...	1,532,722	207,197	1,739,919	34,33,190	96,037	48,114	35,77,341
1886-87 ...	1,593,666	220,984	1,814,650	35,89,499	1,40,028	48,458	37,77,985
1887-88 ...	1,653,627	217,487	1,871,114	37,20,291	1,12,503	45,290	38,78,084
1888-89 ...	1,887,556	231,079	2,118,635	42,25,697	1,94,135	49,604	44,69,436
Average ...	1,650,770	214,728	1,865,498	37,17,009	1,29,759	48,434	38,95,202
1889-90 ...	2,109,804	240,015	2,349,819	45,83,932	1,52,646	55,167	47,91,745
• Increase or Decrease ...	+459,034	+25,287	+484,321	+8,66,923	+22,887	+6,733	+8,96,543

Note.—The figures in this statement, with the exception of Hakába and Miscellaneous, which are actual realizations, are based on assessments.

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE III.

Area of Cultivation and Canal Revenue for 1889-90.

Canals, Executive Districts and Collectorates.			Cultivation. Government.	Jághir.	Total.	Water share of net consolidated Revenue as in Table VII.	Hakába.	Miscellaneous.	Total Canal Revenue.
			Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Frontier, Upper Sind.	Begári Canals.	Desert Canals	82,777	44,802	127,579	1,48,221	51,768	167	2,00,156
		Unharwah	33,840	...	33,840	59,971	...	27	59,998
		Begári Canals	141,533	41,946	183,479	2,75,101	43,655	388	3,19,144
		Works for which no Capital Accounts are kept	...	...	...	...	...	...	...
		Kashmor Bund	5,363	...	5,363	9,954	...	239	10,193
Shikárpur, Collectorate.	Shikárpur Canals.	Canals in Rohri	72,698	4,145	76,843	1,81,952	1,235	2,161	1,85,348
		Bunds in Rohri	...	...	...	...	...	30	30
		Sind Canal	63,645	4,583	68,228	1,74,210	1,028	427	1,75,665
		Sukkur-Begári Bund	...	...	...	...	...	1,409	1,409
		Works for which no Capital Accounts are kept	...	...	...	...	...	8	8
	Ghár Canals.	Sukkur Canal	88,287	2,061	90,348	2,10,821	245	1,577	2,12,643
		Ghár	227,555	8,542	236,097	6,42,041	2,205	5,615	6,49,861
		Nára	151,325	7,317	158,642	4,18,924	1,973	5,044	4,25,941
		Wahur	6,727	...	6,727	16,789	...	41	16,830
		Marvi	4,138	...	4,138	10,712	...	1,051	11,763
		Bunds, right bank	...	...	...	...	...	127	127
		Works for which no Capital Accounts are kept	...	...	...	...	...	9	9
Thar and Párkar.	Eastern Nára Canals.	Nára Supply Channel	6,723	1,007	7,730	16,442	639	4,900	21,981
		Eastern Nára	86,094	...	86,094	1,08,001	...	9,232	1,17,233
		Mithrau Canal	122,171	...	122,171	2,40,675	...	1,148	2,41,823
		Dimwah	9,327	...	9,327	16,939	...	22	16,961
		Heranwah	2,444	...	2,444	4,455	...	...	4,455
		Kipra Canal	6,122	...	6,122	7,672	...	...	7,672
		Thar Canal	48,772	2,553	51,325	90,504	1,191	402	92,097
		Works for which no Capital Accounts are kept	...	...	...	...	...	4	4
Hyderabad Collectorate.	Hyderabad Canals.	Mehrabwah	14,803	226	15,029	25,548	1	180	25,729
		Nasrat	25,671	709	26,380	59,266	232	131	59,629
		Naolakhi	52,753	2,788	55,541	1,16,927	818	515	1,18,260
		Dámbro	9,506	1,112	10,618	20,206	353	81	20,640
		Dadwah	26,366	5,381	31,747	54,291	1,741	664	56,696
		Renwah	14,150	60	14,210	27,542	15	312	27,869
		Alibhar Kacheri	8,898	1,338	10,236	18,195	549	38	18,782
		Márak	45,897	6,680	52,577	99,840	1,838	287	1'01,965
		Gháro Mahmuda	55,202	13,894	69,096	1,12,178	5,285	736	1,18,199
		Kari Shumali	36,078	9,036	45,114	51,010	3,668	285	54,963
		Nasir	28,208	2,090	30,298	52,362	672	154	53,188
		Sarfraz	20,756	5,303	26,059	34,980	1,885	441	37,306
		Other canals	26,937	1,750	28,687	56,940	583	169	57,692
		Works for which no Capital Accounts are kept	...	...	...	...	...	...	...
	Fuleli Canals	Fuleli	267,732	53,490	321,222	5,61,087	23,159	4,046	5,88,292
		Other canals	31,184	949	32,133	55,453	535	253	56,241
		Works for which no Capital Accounts are kept	...	...	...	...	...	...	...
Karáchi Collectorate.	Karáchi Canals.	Nára	70,758	7,770	78,528	1,55,482	2,759	5,264	1,63,505
		Phitta	5,532	726	6,258	11,018	392	212	11,622
		Canals north of Kotri	17,770	1,615	19,385	35,882	596	331	36,809
		Kalri	11,748	448	12,196	24,616	237	592	25,445
		Baghar	22,851	2,011	24,862	48,381	919	204	49,504
		Uchita	9,830	117	9,947	19,366	51	10	19,427
		Canals in Tatta, &c.	10,480	1,565	12,045	18,014	428	1,597	20,039
		Shal Canals	2,965	...	2,965	7,498	...	15	7,513
		Pinyári	77,948	1,932	79,880	1,66,658	907	3,296	1,70,861
		Canals in Mirpur Batoro	17,743	...	17,743	37,415	..	38	37,453
		Canals in Sujáwal	7,861	285	8,146	13,304	160	72	13,536
		Satta	9,543	227	9,770	18,317	99	1	18,417
		Other canals in Jati	2,051	87	2,138	4,784	111	...	4,895
		Khanta	5,003	122	5,125	11,767	36	35	11,838
		Kokawari	12,345	...	12,345	28,290	...	1,066	29,356
		Other canals in Shahbandar	1,694	329	2,023	3,931	171	112	4,214
		Bunds, left bank	...	341	341	...	121	...	121
		Bunds, right bank	...	678	678	...	386	...	386
		Works for which no Capital Accounts are kept	...	...	...	...	...	2	2
Begári Canals			263,513	86,748	350,261	4,93,247	95,423	821	5,89,491
Shikárpur Canals			136,343	8,728	145,071	3,56,162	2,263	4,035	3,62,460
Ghár Canals			478,032	17,920	495,952	12,99,287	4,423	13,464	13,17,174
Eastern Nára			281,653	3,560	285,213	4,84,688	1,830	15,708	5,02,226
Hyderabad Canals			365,225	50,367	415,592	7,29,285	17,610	3,993	7,50,918
Fuleli Canals			298,916	54,439	353,355	6,16,540	23,694	4,299	6.44,533
Karáchi Canals			286,122	18,253	304,375	6,04,723	7,373	12,847	6,24,943
		Total	2,109,804	240,015	2,349,819	45,83,932	1,52,646	55,167	47,91,745

Note.—The figures in this statement, with the exception of Hakába and Miscellaneous, which are actuals, are based on assessments.

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE IV.

Revenue Expenditure on New Works, Maintenance and Repairs and Revenue Collection Charges in the Civil Department for 1889-90.

	Canals and Executive Districts.	Revenue Expenditure.								Total Revenue Expenditure.			
		Improvements.			Maintenance and Repairs.			Revenue Collection Charges in Civil Department.	Total Columns 5 to 8.	Works.	Establishment.		Total.
		Works.	Establishment, Tools and Plant.	Total.	Works.	Establishment, Tools and Plant.	Total.				Public Works Department.	Civil Department.	
	1	2	3	4	5	6	7	8	9	10	11	12	13
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals.	Desert Canal	...	...	...	29,935	6,969	36,904	14,490	51,394	29,935	6,969	14,490	51,394
	Unharwah	..	...	...	9,443	1,783	11,226	4,540	15,766	9,443	1,783	4,540	15,766
	Begari Canal	...	...	...	62,880	12,951	75,831	24,864	1,00,695	62,880	12,951	24,864	1,00,695
	Kashmor Bund	1,09,224	30,451	1,39,675	34,496	9,617	44,113	991	45,104	1,43,720	40,068	991	1,84,779
Shikárpur Canals.	Canals in Rohri	3,198	1,116	4,314	42,009	14,684	56,693	18,339	75,032	45,207	15,800	18,339	79,346
	Bunds in Rohri	...	...	...	2,923	1,021	3,944	...	3,944	2,923	1,021	...	3,944
	Sind Canal...	...	...	..	19,056	6,655	25,711	17,437	43,148	19,056	6,655	17,437	43,148
	Sukkur-Begári Bund ...	6	2	8	20,400	7,111	27,511	...	27,511	20,406	7,113	...	27,519
Ghár Canals.	Sukkur Canal	...	...	...	19,455	3,589	23,044	13,938	36,982	19,455	3,589	13,938	36,982
	Ghár	12,697	2,342	15,039	62,769	11,581	74,350	52,864	1,27,214	75,466	13,923	52,864	1,42,253
	Nára	86,413	15,739	1,02,152	35,426	6,411	41,837	41,823	83,660	1,21,839	22,150	41,823	1,85,812
	Wahur	...	...	...	2,067	374	2,441	1,679	4,120	2,067	374	1,679	4,120
	Marvi	...	...	...	1,287	233	1,520	1,148	2,668	1,287	233	1,148	2,668
	Bunds, right bank ...	37,184	6,730	43,914	21,508	3,893	25,401	...	25,401	58,692	10,623	...	69,315
Eastern Nára.	Nára Supply Channel ...	...	...	...	2,050	1,241	3,291	1,567	4,858	2,050	1,241	1,567	4,858
	Eastern Nára	...	...	...	10,642	6,488	17,130	11,227	28,357	10,642	6,488	11,227	28,357
	Mithrau Canal	1,508	917	2,425	25,547	15,591	41,138	24,022	65,160	27,055	16,508	24,022	67,585
	Dimwah	...	...	...	761	464	1,225	1,694	2,919	761	464	1,694	2,919
	Heranwah	...	...	...	75	45	120	446	566	75	45	446	566
	Kipra Canal	...	...	...	491	280	771	767	1,538	491	280	767	1,538
	Thar Canal	...	...	...	10,278	6,282	16,560	9,174	25,734	10,278	6,282	9,174	25,734
Hyderabad Canals.	Mehrabwah	...	...	...	14,343	3,026	17,369	2,555	19,924	14,343	3,026	2,555	19,924
	Nasrat	...	...	...	15,624	3,557	19,181	5,961	25,142	15,624	3,557	5,961	25,142
	Naolakhi	...	...	...	19,809	4,510	24,319	11,785	36,104	19,809	4,510	11,785	36,104
	Dambro	16,914	3,851	20,765	5,263	1,198	6,461	2,064	8,525	22,177	5,049	2,064	29,290
	Dadwah	...	...	...	15,543	3,539	19,082	5,612	24,694	15,543	3,539	5,612	24,694
	Renwah	32,500	7,399	39,899	10,355	2,357	12,712	2,765	15,477	42,855	9,756	2,765	55,376
	Alibhar Kacheri	...	...	...	4,118	869	4,987	1,032	6,019	4,118	869	1,032	6,019
	Marak	...	...	...	14,883	3,140	18,023	6,522	24,545	14,883	3,140	6,522	24,545
	Ghâro Mahmuda	...	...	...	23,216	5,285	28,501	11,759	40,260	23,216	5,285	11,759	40,260
	Kari Shumali	...	...	...	12,001	2,732	14,733	5,500	20,233	12,001	2,732	5,500	20,233
	Nasir	...	...	...	14,666	3,339	18,005	5,316	23,321	14,666	3,339	5,316	23,321
	Sarfraz	...	...	...	16,933	3,571	20,504	2,571	23,075	16,933	3,571	2,571	23,075
	Other canals	...	...	...	15,083	3,434	18,517	5,647	24,164	15,083	3,434	5,647	24,164
Fuleli Canals.	Fuleli	...	...	...	1,92,237	30,385	2,22,622	45,460	2,68,082	1,92,237	30,385	45,460	2,68,082
	Other canals	5,144	827	5,971	19,897	3,201	23,098	5,598	28,696	25,041	4,028	5,598	34,667
Karáchi Canals.	Nára	2,087	761	2,848	15,576	5,702	21,278	16,200	37,478	17,663	6,463	16,200	40,326
	Phitta	...	...	...	2,661	971	3,632	1,159	4,791	2,661	971	1,159	4,791
	Canals north of Kotri ...	...	...	...	9,359	3,424	12,783	3,551	16,334	9,359	3,424	3,551	16,334
	Kalri	...	...	...	15,645	5,717	21,362	2,549	23,911	15,645	5,717	2,549	23,911
	Baghar	4,216	1,548	5,764	16,953	6,194	23,147	4,988	28,135	21,169	7,742	4,988	33,899
	Uchita	...	...	...	517	24	541	1,991	2,532	517	24	1,991	2,532
	Canals in Tatta, &c. ...	...	...	...	8,991	3,290	12,281	2,020	14,301	8,991	3,290	2,020	14,301
	Shal Canal...	...	...	...	2,602	954	3,556	785	4,341	2,602	954	785	4,341
	Pinyári	...	...	...	29,536	10,799	40,335	17,139	57,474	29,536	10,799	17,139	57,474
	Canals in Mirpur Batoro...	...	...	...	6,580	2,400	8,980	3,904	12,884	6,580	2,400	3,904	12,884
	Canals in Sujáwal ...	...	...	...	1,907	701	2,608	1,352	3,960	1,907	701	1,352	3,960
	Satta	...	...	...	5,117	1,876	6,993	1,904	8,897	5,117	1,876	1,904	8,897
	Canals in Jati	...	...	...	1,587	579	2,166	600	2,766	1,587	579	600	2,766
	Khanta	...	...	...	12,422	4,546	16,968	1,164	18,132	12,422	4,546	1,164	18,132
	Kokawari	2,995	1,102	4,097	4,083	1,496	5,579	2,982	8,561	7,078	2,598	2,982	12,658
	Canals in Shâhbandar ...	...	...	...	3,234	1,180	4,414	408	4,822	3,234	1,180	408	4,822
	Bunds, left bank	4,712	1,719	6,431	10,799	3,949	14,748	12	14,760	15,511	5,668	12	21,191
	Bunds, right bank ...	...	...	...	10,479	3,833	14,312	39	14,351	10,479	3,833	39	14,351
	Begári Canals	1,09,224	30,451	1,39,675	1,36,754	31,320	1,68,074	44,885	2,12,959	2,45,978	61,771	44,885	3,52,634
	Shrikárpur Canals	3,204	1,118	4,322	84,388	29,471	1,13,859	35,776	1,49,635	87,592	30,589	35,776	1,53,957
	Ghár Canals	1,36,294	24,811	1,61,105	1,42,512	26,081	1,68,593	1,11,452	2,80,045	2,78,806	50,892	1,11,452	4,41,150
	Eastern Nára Canals	1,508	917	2,425	49,844	30,391	80,235	48,897	1,29,132	51,352	31,308	48,897	1,31,557
	Hyderabad Canals	49,414	11,250	60,664	1,81,837	40,557	2,22,394	69,089	2,91,483	2,31,251	51,807	69,089	3,52,147
	Fuleli Canals	5,144	827	5,971	2,12,134	33,586	2,45,720	51,058	2,96,778	2,17,278	34,413	51,058	3,02,749
	Karáchi Canals	14,010	5,130	19,140	1,58,048	57,635	2,15,683	62,747	2,78,430	1,72,058	62,765	62,747	2,97,570
	Total ...	3,18,798	74,504	3,93,302	9,65,517	2,49,041	12,14,558	4,23,904	16,38,462	12,84,315	3,23,545	4,23,904	20,31,764

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE V.

Cultivation, Canal Revenue and Expenditure for 1889-90 as contrasted with three previous years.

Canals and Executive Districts.	Average of three previous years.			Percentage of Expenditure on Revenue.	Cost of Maintenance per acre.	1889-90.			Percentage of Expenditure on Revenue.	Cost of Maintenance per acre.	Length in miles of	
	Cultivation.	Canal Revenue.	Maintenance and Revenue Collections.			Cultivation.	Canal Revenue.	Maintenance and Revenue Collections.			Canals.	Bunds.
	Acres.	Rs.	Rs.			Acres.	Rs.	Rs.				
Begári Canals — Desert Canal	92,756	1,41,311	45,507	32·20	0·5	127,579	2,00,156	51,394	25·67	0·4	190	...
Begári Canals — Unharwah	32,300	58,746	18,640	31·73	0·6	33,840	59,998	15,766	26·28	0·5	67	...
Begári Canals — Begári Canal	177,093	3,04,670	83,637	27·45	0·5	183,479	3,19,144	1,00,695	31·55	0·5	176	...
Begári Canals — Kashmor Bund	4,245	7,822	41,782	...	...	5,363	10,189	45,104	...	...	...	48
Shikárpur Canals — Canals in Rohri	79,583	1,87,820	63,524	33·82	0·8	76,843	1,85,347	75,032	40·48	1·0	240	...
Shikárpur Canals — Bunds in Rohri	...	2	3,167	...	...	...	30	3,944	...	...	...	54
Shikárpur Canals — Sind Canal	55,988	1,46,061	43,850	30·02	0·8	68,228	1,75,666	43,148	24·56	0·6	98	...
Shikárpur Canals — Sukkur Begári Bund	3	404	44,572	...	...	..	1,409	27,511	...	...	...	36
Ghár Canals — Sukkur Canal	74,574	1,76,873	40,220	22·74	0·5	90,348	2,12,643	36,982	17·34	0·4	127	...
Ghár Canals — Ghár	184,086	5,12,750	1,34,606	26·25	0·7	236,097	6,49,861	1,27,214	19·57	0·5	381	...
Ghár Canals — Nára	135,633	3,90,848	99,089	25·36	0·7	158,642	4,25,941	83,660	14·94	0·5	238	...
Ghár Canals — Wahur	6,540	16,200	3,765	23·24	0·6	6,727	16,830	4,210	25·01	0·6	23	...
Ghár Canals — Marvi	3,869	11,825	2,214	18·72	0·6	4,138	11,763	2,668	22·68	0·6	15	...
Ghár Canals — Bunds, right bank	126	225	9,316	...	...	...	127	25,401	...	...	...	118
Eastern Nára Canals — Nára Supply Channel	3,838	10,907	6,034	54·49	1·6	7,730	21,981	4,858	22·10	0·6	12	...
Eastern Nára Canals — Eastern Nára	27,168	48,209	17,503	36·31	0 6	86,094	1,17,233	28,357	24·19	0·3	20	102
Eastern Nára Canals — Mithrau Canal	104,846	2,05,924	53,438	25·95	0·5	122,171	2,41,823	65,160	26·94	0·5	155	93
Eastern Nára Canals — Dimwah	2,663	4,438	951	21·43	0·4	9,327	16,961	2,919	17·21	0·3	28	...
Eastern Nára Canals — Heranwah	1,393	2,698	308	14·01	0·2	2,444	4,445	566	12·70	0·2	3	...
Eastern Nára Canals — Kipra Canal	...	...	...	...	...	6,122	7,672	1,538	20·05	0·3	10	...
Eastern Nára Canals — Thar Canal	34,828	65,184	22,334	34·26	0·6	51,325	92,097	25,734	27·94	0·5	65	33
Hyderabad Canals — Mehrabwah	12,979	23,643	14,933	63·16	1·2	15,029	25,729	19,924	77·43	1·3	59	...
Hyderabad Canals — Nasrat	20,325	47,148	20,759	44·03	1·02	26,380	59,629	25,142	42·16	0·9	66	...
Hyderabad Canals — Naolakhi	51,377	1,09,134	31,107	28·50	0·6	55,541	1,18,260	36,104	30·53	0·6	137	...
Hyderabad Canals — Dambro	7,913	15,772	10,362	65·70	1·3	10,618	20,640	8,525	41·30	0·8	56	...
Hyderabad Canals — Dadwah	28,330	49,826	23,776	47·72	0·8	31,747	56,696	24,594	43·38	0·8	105	...
Hyderabad Canals — Renwah	16,075	30,793	23,340	75·71	1·4	14,210	27,869	15,477	55·54	1·9	134	...
Hyderabad Canals — Alibhar Kacheri	7,090	13,084	8,843	67·59	1·2	10.236	18,782	6,019	32·05	0·6	56	...
Hyderabad Canals — Márak	43,234	85,588	18,244	21·32	0·4	52,577	1,01,965	24,545	24·07	0·5	194	1
Hyderabad Canals — Gháro Mahmuda	59,127	87,652	38,886	44·36	0·6	69,096	1,18,199	40,260	34·07	0·7	291	...
Hyderabad Canals — Kari Shumali	39,058	45,418	18,656	41·08	0·5	45,114	54,963	20,233	36·81	0·5	214	...
Hyderabad Canals — Nasirwah	29,023	48,255	19,991	41·43	0·7	30,298	53,188	23,321	43·85	0·8	130	...
Hyderabad Canals — Sarfrazwah	24,129	32,683	15,178	46·13	0·6	26,059	37,306	23,075	61·88	0·9	116	...
Hyderabad Canals — Other canals	25,637	50,721	21,109	41·62	0·8	28,687	57,692	24,164	41·88	0·8	112	...
Fuleli Canals — Fuleli	273,257	5,05,140	2,29,125	45·36	0·8	321,222	5,88,292	2,68,082	45·57	0·8	995	...
Fuleli Canals — Other canals	17,400	41,015	28,157	68·65	1·6	32,133	56,241	28,696	51·03	0·	146	12
Karáchi Canals — Nára	70,079	1,45,423	33,773	23·22	0·5	78,528	1,63,505	37,478	22·92	0·5	112	...
Karáchi Canals — Phitta	5,557	10,100	4,374	43·30	0·8	6,258	11,622	4,791	41·22	0·8	27	...
Karáchi Canals — Canals north of Kotri	16,171	27,745	11,142	40·16	0·7	19,385	36,809	16.334	44·39	0·8	58	...
Karáchi Canals — Kalri	9,782	21,726	13,971	64·30	1·4	12,196	25,445	23,911	93·97	1·9	136	...
Karáchi Canals — Baghar	18,844	33,412	13,885	41·56	0·7	24,862	49,504	28,135	56·83	1·1	108	...
Karáchi Canals — Uchita	10,535	23,966	2,718	11·34	0·3	9,947	19,427	2,532	13·03	0·3	44	...
Karáchi Canals — Canals in Tatta, &c.	10,445	17,808	7,211	40·49	0·7	12,045	20,039	14,301	71·36	1·2	83	...
Karáchi Canals — Shal Canals	2,876	6,826	2,534	37·12	0·9	2,965	7,513	4,341	57·78	1·5	18	...
Karáchi Canals — Pinyári	64,573	1.59,574	56,963	35·69	0·9	79,880	1,70,861	57,474	33·64	0·7	328	..
Karáchi Canals — Canals in Mirpur Batoro	11,604	28,126	11,323	40·26	0·9	17,743	37,453	12,884	34·40	0·7	81	...
Karáchi Canals — Canals in Sujáwal	6,823	16,210	4,468	27·56	0·7	8,146	13,536	3,960	29·25	0·5	35	...
Karáchi Canals — Satta	8,487	18,061	7,456	41·28	0·9	9,770	18,417	8,897	48·30	0·9	58	...
Karáchi Canals — Canals in Jati	2,041	4,952	1,438	29·04	0·7	2.138	4,495	2,766	56·50	1·3	11	...
Karáchi Canals — Khanta	5,095	11,215	5,878	52·41	1·4	5,125	11,838	18,132	153 17	3·2	59	...
Karáchi Canals — Kokawari	10,686	22,632	5,243	23·17	0·5	12,345	29,356	8,561	29·16	0·7	100	...
Karáchi Canals — Canals in Sháhbandar	1,955	3,906	3,701	94·75	1·9	2,023	4,214	4,822	114·42	2·3	7	...
Karáchi Canals — Bunds, left bank	616	187	58,117	...	...	341	121	14,760	...	...	...	65
Karáchi Canals — Bunds, right bank	541	908	35,371	...	...	678	386	14,351	...	...	...	91
Begári Canals	306,394	5,12,549	1,89,566	36·98	0·6	350,261	5,89,487	2,12,959	36·12	0·6	433	48
Shikárpur Canals	135.574	3,34,287	1,55,113	46·40	1·1	145,071	3,62,452	1,49,635	41·28	1·0	338	90
Ghár Canals	404,828	11,08,721	2,89,210	26·08	0·7	495,952	13,17,165	2,80,045	21·26	0·6	784	118
Eastern Nára Canals	174,936	3,37,360	1,00,566	29·81	0·6	285,213	5,02,222	1,29,132	25·71	0·4	293	228
Hyderabad Canals	364,297	6,39,717	2,65,184	41·45	0·7	415,592	7,50,918	2,91,483	38·82	0·7	1,670	1
Fuleli Canals	290,657	5,46,155	2,57,282	47·11	0·8	353,355	6,44,533	2,96,778	46·05	0·8	1,141	12
Karáchi Canals	256,710	5,52,777	2,79,566	50·57	1·1	304,375	6,24,941	2,78,430	44·55	0·9	1,265	156
Total	1,933,396	40,31,566	15,36,487	38·12	0·8	2,349,819	47,91,718	16,38,462	34·19	0·7	5,924	653
Agricultural Receipts							27					
							47,91,745					

H. M. THOMPSON, M.Inst.,C.E.,
Superintending Engineer in Sind.

TABLE VI.

Direct and Indirect Receipts of Canal Revenue for 1889-90.

Canals and Executive Districts.		Water share of net consolidated Revenue as in Table VII.	Deduct average before Improvement.	Balance Irrigation share due to Canals.	Direct Receipts —Hakába and Miscellaneous.	Receipts from Sales of Occupancy Rights.	Total Direct and Indirect Receipts.
1		2	3	4	5	6	7
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canals ...	Desert Canal...	1,48,221	.....	1,48,221	51,935	935	2,01,091
	Unnarwah	59,971	.....	59,971	27	1,251	61,249
	Begári Canal...	2,75,101	24,856	2,50,245	44,043	4,002	2,98,290
	Kashmor Bund	9,954	.....	9,954	235	218	10,407
Shikárpur Canals ...	Canals in Rohri	1,81,952	.....	1,81,952	3,395	611	1,85,958
	Bunds in Rohri	.....	.....	.....	30	.....	30
	Sind Canal	1,74,210	.....	1,74,210	1,456	245	1,75,911
	Sukkur-Begári Bunds ...	.....	.....	.....	1,409	.....	1,409
Ghár Canal	Sukkur Canal	2,10,821	71,550	1,39,271	1,822	245	1,41,338
	Ghár Canal	6,42,041	1,16,832	5,25,209	7,820	201	5,33,230
	Nára	4,18,924	.....	4,18,924	7,017	18	4,25,959
	Wahur	16,789	.....	16,789	41	.....	16,830
	Marvi	10,712	.....	10,712	1,051	93	11,856
	Bunds, right bank	.....	.....	.....	127	.....	127
Eastern Nára ...	Nára Supply Channel ...	16,442	.....	.....	5,539	9	21,990
	Eastern Nára	1,08,001	3,444	1,04,557	9,232	.....	1,13,789
	Mithrau Canal	2,40,675	.....	2,40,675	1,148	.....	2,41,823
	Dimwah	16,939	.....	16,939	22	.....	16,961
	Heranwah	4,455	.....	4,455	.....	.....	4,455
	Kipra Canal	7,672	.....	7,672	.....	.....	7,672
	Thar Canal	90,504	.....	90,504	1,593	.....	92,097
Hyderabad Canals ...	Mehrabwah	25,548	.....	25,548	181	233	25,962
	Nasrat	59,266	.....	59,266	363	117	59,746
	Naolakhi	1,16,927	.....	1,16,927	1,333	107	1,18,367
	Dámbro	20,206	.....	20,206	434	83	20,723
	Dad	54,291	.....	54,291	2,405	93	56,789
	Ren	27,542	.....	27,542	327	98	27,967
	Alibhar Kacheri	18,195	8,427	9,768	587	80	10,435
	Márak...	99,840	36,459	63,381	2,125	202	65,705
	Gháro Mahmuda	1,12,178	.....	1,12,178	6,021	125	1,18,324
	Kari Shumali	51,010	.....	51,010	3,953	324	55,287
	Nasirwah	52,362	.....	52,362	826	127	53,315
	Sarfraz	34,980	11,155	23,825	2,326	182	26,333
	Other canals...	56,940	.....	56,940	752	86	57,778
Fuleli Canals... ...	Fuleli...	5,61,087	1,30,284	4,30,803	27,205	544	4,58,552
	Other canals...	55,453	.....	55,453	788	10	56,251
Karáchi Canals ...	Nára	1,55,482	.....	1,55,482	8,023	295	1,63,800
	Phitta...	11,018	.....	11,018	604	84	11,706
	Canals north of Kotri ...	35,882	.....	35,882	927	137	36,946
	Kalri	24,616	.....	24,616	829	5	25,450
	Baghar	48,381	.....	48,381	1,123	15	49,519
	Uchita	19,366	.....	19,366	61	4	19,431
	Canals in Tatta, &c.... ...	18,014	.....	18,014	2,025	3	20,042
	Shal Canal	7,498	.....	7,498	15	.....	7,513
	Pinyári	1,66,658	.....	1,66,658	4,203	200	1,71,061
	Canals in Mirpur Batoro ...	37,415	.....	37,415	38	59	37,512
	Canals in Sujáwal	13,304	.....	13,304	232	17	13,553
	Satta	18,317	.....	18,317	100	1	18,418
	Canals in Jati	4,784	.....	4,784	111	6	4,901
	Khanta	11,767	.....	11,767	71	1	11,839
	Kokawari	28,290	.....	28,290	1,066	6	29,362
	Canals in Sháhbandar ...	3,931	.....	3,931	283	.....	4,214
	Bunds, left bank	.....	.....	.....	121	.....	121
	Bunds, right bank	.....	.....	.....	386	.....	386
Begári Canals		4,93,247	24,856	4,68,391	96,240	6,406	5,71,037
Shikárpur Canals...		3,56,162	.....	5,56,162	6,290	856	3,63,308
Ghár Canals		12,99,287	1,88,382	11,10,905	17,878	557	11,29,340
Eastern Nára		4,84,688	3,444	4,81,244	17,534	9	4,98,787
Hyderabad Canals		7,29,285	56,041	6,73,244	21,633	1,857	6,96,734
Fuleli Canals		6,16,540	1,30,284	4,86,256	27,993	554	5,14,803
Karáchi Canals		6,04,723	.....	6,04,723	20,218	833	6,25,774
	Total ...	45,83,932	4,03,007	41,80,925	3,07,786	11,072	43,99,783
	Add—Agricultural Receipts ...				27	.....	27
	Total ...				2,07,813	11,072	43,99,810

NOTE.—The figures in this statement, with the exception of Hakába, Miscellaneous and occupancy fees, all of which are actuals, are based on assessments.

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind,

TABLE VI-A.

Actual Direct and Indirect Receipts of Canal Revenue in 1889-90 as shown in General Revenue Accounts of Executive Districts prepared by the Examiner, Public Works Accounts.

Canals and Districts.		Water share of net consolidated Revenue collected.	Deduct average before Improvement.	Balance Irrigation share due to Canals.	Direct Receipts, Hakába and Miscellaneous.	Receipts from Sales of Occupancy Rights.	Total Direct and Indirect Receipts.
1		2	3	4	5	6	7
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begári Canal...	Desert Canal	1,44,758	.....	1,44,758	51,935	935	1,97,628
	Unharwah	45,400	.....	45,400	27	1,251	46,678
	Begári Canals	2,70,696	24,856	2,45,840	44,043	4,002	2,93,885
	Kashmor Bund	9,913	.....	9,913	235	218	10,366
Shikárpur Canals	Canals in Rohri	1,82,059	.....	1,82,059	3,395	611	1,86,065
	Bunds in Rohri	.....	.....	.....	30	.....	30
	Sind Canal...	1,73,314	.....	1,73,314	1,456	245	1,75,015
	Sukkur-Begári Bund	.....	.....	.....	1,409	.....	1,409
Ghár Canals	Sukkur Canal	2,10,643	71,550	1,39,093	1,822	245	1,41,160
	Ghár	6,40,736	1,16,832	5,23,904	7,820	201	5,31,925
	Nára	4,14,034	.....	4,14,034	7,017	18	4,21,069
	Wahur	16,789	.....	16,789	41	.....	16,830
	Marvi	10,447	.....	10,447	1,051	93	11,591
	Bunds, right bank	.....	.....	.....	127	.....	127
Eastern Nára Canals...	Nára Supply Channel	15,035	.....	15,035	5,539	9	20,583
	Eastern Nára	1,06,550	3,444	1,03,106	9,232	.....	1,12,338
	Mithrau Canal	2,40,222	.....	2,40,222	1,148	.....	2,41,370
	Dimwah	16,939	.....	16,939	22	.....	16,961
	Heranwah	4,455	.....	4,455	.....	.....	4,455
	Kipra Canal	7,672	.....	7,672	.....	.....	7,672
	Thar Canal	90,543	.....	90,543	1,593	.....	92,136
Hyderabad Canals	Mehrabwah	25,548	.....	25,548	181	233	25,962
	Nasrat	59,266	.....	59,266	363	117	59,746
	Naolakhi	1,16,927	.....	1,16,927	1,333	107	1,18,367
	Dambro	20,206	.....	20,206	434	83	20,723
	Dad	54,291	.....	54,291	2,405	93	56,789
	Ren	27,542	.....	27,542	327	98	27,967
	Alibhar Kacheri	18,195	8,427	9,768	587	80	10,435
	Marak	99,840	36,459	63,381	2,125	202	65,708
	Gháro Mahmuda	1,12,177	.....	1,12,177	6,021	125	1,18,323
	Kari Shumali	51,010	.....	51,010	3,953	324	55,287
	Nasirwah	52,362	.....	52,362	826	127	53,315
	Sarfrazwah	34,980	11,155	23,825	2,326	182	26,333
	Other canals	56,940	.....	56,940	752	86	57,778
Fuleli Canals...	Fuleli	5,61,729	1,30,284	4,31,445	27,205	544	4,59,194
	Other canals	55,444	.....	55,444	788	10	56,242
Karáchi Canals	Nára	1,54,334	.....	1,54,334	8,023	295	1,62,652
	Phitta	11,020	.....	11,020	604	84	11,708
	Canals north of Kotri	35,878	.....	35,878	927	137	36,942
	Kalri	25,051	.....	25,051	829	5	25,885
	Baghar	48,810	.....	48,810	1,123	15	49,948
	Uchita	19,854	.....	19,854	61	4	19,919
	Canals in Tatta, &c.	18,217	.....	18,217	2,025	3	20,245
	Shal Canals	7,853	.....	7,853	15	.....	7,868
	Pinyári	1,67,180	.....	1,67,180	4,203	200	1,71,583
	Canals in Mirpur Batoro	39,033	.....	39,033	38	59	39,130
	Canals in Sujáwal	13,304	.....	13,304	232	17	13,553
	Satta	18,945	.....	18,945	100	1	19,046
	Canals in Jati	5,890	.....	5,890	111	6	6,007
	Khanta	11,608	.....	11,608	71	1	11,680
	Kokawari	28,751	.....	28,751	1,066	6	29,823
	Canals in Sháhbandar	3,797	.....	3,797	283	.....	4,080
	Bunds, left bank	.....	.....	.....	121	.....	121
	Bunds, right bank	.....	.....	.....	386	.....	386
Begári Canals		4,70,767	24,856	4,45,911	96,240	6,406	5,48,557
Shikárpur Canals		3,55,373	.....	3,55,373	6,290	856	3,62,519
Ghár Canals		12,92,649	1,88,382	11,04,267	17,878	557	11,22,702
Eastern Nára Canals		4,81,416	3,444	4,77,972	17,534	9	4,95,515
Hyderabad Canals		7,29,284	56,041	6,73,243	21,633	1,857	6,96,733
Fuleli Canals		6,17,173	1,30,284	4,86,889	27,993	554	5,15,436
Karáchi Canals		6,09,525	.....	6,09,525	20,218	833	6,30,576
	Total	45,56,187	4,03,007	41,53,180	2,07,786	11,072	43,72,038
	Add— Agricultural Receipts				27	.....	27
	Total				2,07,813	11,072	*43,72,065

NOTE.—The figures in this table are based on actual realizations.

*43,72,065
4,03,007

47,75,072—*Vide* Statement E (3) in Report.

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE VII.

Area of Cultivation and Consolidated Revenue for 1889-90.

	Canals and Districts.	Cultivation.			Consolidated Revenue.			Remissions.			Net consolidated Revenue.	Land share 10 per cent.	Water share 90 per cent.
		Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.			
		Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Begari Canals.	Desert Canal ...	77,340	5,437	82,777	1,54,602	10,529	1,65,131	441	...	441	1,64,690	16,469	1,48,221
	Unharwah	32,270	1,570	33,840	65,428	3,263	68,691	2,057	...	2,057	66,634	6,663	59,971
	Begári Canal	136,150	5,383	141,533	2,99,511	30,589	3,30,100	8,501	15,931	24,432	3,05,668	30.567	2,75,101
	Kashmor Bund... ...	2,597	2,766	5,363	5,240	5,820	11,060	...	...	...	11,060	1,106	9,954
Shikárpur Canals.	Canals in Rohri ...	58,908	13,790	72,698	1,63,766	38,417	2,02,183	13	1	14	2,02,169	20,217	1,81,952
	Bunds in Rohri... ...	...	...	...	...	...	...	...	...	...	...	...	...
	Sind Canal	56,175	7,470	63,645	1,64,994	28,604	1,93,598	...	31	31	1,93,567	19,357	1,74,210
	Sukkur-Begári Bund ...	...	...	...	...	...	...	...	...	...	...	...	...
Ghár Canals.	Sukkur Canal	63,886	24,401	88,287	1,61,894	78,322	2,40,216	...	5,970	5,970	2,34,246	23,425	2,10,821
	Ghár Canal	177,041	50,514	227,555	5,87,919	1,81,235	7,69,154	32,278	23,497	55,775	7,13,379	71,338	6,42,041
	Nára	121,462	29,863	151,325	4,05,990	1,00,641	5,06,631	41,051	110	41,161	4,65,470	46,546	4,18,924
	Wahur	5,713	1,014	6,727	16,038	2,617	18,655	...	...	...	18,655	1,866	16,789
	Marvi	2,991	1,147	4,138	7,338	4,564	11,902	...	...	...	11,902	1,190	10,712
	Bunds, right bank ...	...	...	...	...	...	...	...	...	...	...	...	...
Eastern Nára.	Nára Supply Channel ...	409	6,314	6,723	1,354	16,915	18,269	...	...	...	18,269	1,827	16,442
	Eastern Nára	21,540	64,554	86,094	31,520	91,794	1,23,314	3,314	...	3,314	1,20,000	11,999	1,08,001
	Mithrau Canal	98,629	23,542	122,171	2,23,054	44,361	2,67,415	...	...	...	2,67,415	26,740	2,40,675
	Dimwah...	8,688	639	9,327	17,760	1,061	18,821	...	..	...	18,821	1,882	16,939
	Heranwah	2,260	184	2,444	4,450	499	4,949	...	...	...	4,949	494	4,455
	Kipra Canal	4,472	1,650	6,122	7,374	2,253	9,627	1,103	...	1,103	8,524	852	7,672
	Thar Canal	36,289	12,483	48,772	82,213	18,926	1,01,139	579	...	579	1,00,560	10,056	90,504
Hyderabad Canals.	Mehrabwah	13,382	1,421	14,803	28,098	2,952	31,050	2,663	...	2,663	28,387	2,839	25,548
	Nasrat	21,444	4,227	25,671	57,725	10,345	68,070	2,219	...	2,219	65,851	6,585	59,266
	Naolakhi	47,788	4,965	52,753	1,19,656	10,605	1,30,261	342	...	342	1,29,919	12,992	1,16,927
	Dámbro	8,944	562	9 506	21,231	1,220	22,451	...	...	...	22,451	2,245	20,206
	Dadwah	24,267	2,099	26,366	54,843	5,527	60,370	47	...	47	60,323	6,032	54,291
	Renwah	13,012	1,138	14,150	28,058	2,767	30,825	223	...	223	30,602	3,060	27,542
	Alibhar Kacheri ...	8,865	33	8,898	19,967	250	20,217	...	...	...	20,217	2,022	18,195
	Márak	45,353	544	45,897	1,05,802	5,131	1,10,933	...	...	...	1,10,933	11,093	99,840
	Gháro Mahmuda ...	50,991	4,211	55,202	1,14,946	9,864	1,24,810	162	6	168	1,24,642	12,464	1,12,178
	Kari Shumali	35,036	1,042	36,078	55,439	2,263	57,702	1,024	...	1,024	56,678	5,668	51,010
	Nasirwah	26,895	1,313	28,208	55,963	2,936	58,899	719	...	719	58,180	5,818	52,362
	Sarfrazwah	19,760	996	20,756	36,395	2,878	39,273	406	...	406	38,867	3,887	34,980
	Other canals	22,021	4,916	26,937	52,614	11,659	64,273	969	37	1,006	63,267	6,327	56,940
Fuleli Canals.	Fuleli	227,463	40,269	267,732	5,51,175	83,391	6,34,566	11,082	56	11,138	6,23,428	62,341	5,61,087
	Other canals	21,663	9,521	31,184	55,127	26,267	81,394	19,780	...	19,780	61,614	6,161	55,453
Karáchi Canals.	Nára	42,549	28,209	70,758	1,04,288	70,364	1,74,652	1,895	...	1,895	1,72,757	17,275	1,55,482
	Phitta	3,943	1,589	5,532	8,521	3,721	12,242	...	...	...	12,242	1,224	11,018
	Canals north of Kotri ...	13,909	3,861	17,770	30,643	9,308	39,951	82	...	82	39,869	3,987	35,882
	Kalri	10,179	1,569	11,748	25,345	4,732	30,077	2,726	...	2,726	27,351	2,735	24,616
	Baghar	16,206	6,645	22,851	39,440	16,026	55,466	1,709	...	1,709	53,757	5,376	48,381
	Uchita	8,825	1,005	9,830	20,088	2,098	22,186	668	...	668	21,518	2,152	19,366
	Canals in Tatta, &c. ...	9,036	1,444	10,480	21,006	4,027	25,033	5,017	...	5,017	20,016	2,002	18,014
	Shal Canals	2,664	301	2,965	7,510	821	8,331	...	...	...	8,331	833	7,498
	Pinyári	69,718	8,230	77,948	1,97,552	16,941	2,14,493	29,318	...	29,318	1,85,175	18,517	1,66,658
	Canals in Mirpur Batoro	15,710	2,033	17,743	44,234	5,040	49,274	7,702	...	7,702	41,572	4,157	37,415
	Canals in Sujáwal ...	6,347	1,514	7,861	18,786	3,503	22,289	7,507	...	7,507	14,782	1,478	13,304
	Satta	9,077	466	9,543	20,178	1,047	21,225	873	...	873	20,352	2,035	18,317
	Canals in Jati	1,795	256	2,051	5,560	591	6,151	835	...	835	5,316	532	4,784
	Khanta	4,751	252	5,003	12,532	605	13,137	62	...	62	13,075	1,308	11,767
	Kokawari	12,010	335	12,345	31,053	816	31,869	436	...	436	31,433	3,143	28,290
	Canals in Shahbandar ...	1,617	77	1,694	4,149	219	4,368	...	...	...	4,368	437	3,931
	Bunds, left bank ...	...	...	...	...	...	...	...	...	...	...	...	...
	Bunds, right bank ..	...	...	...	...	...	...	...	...	...	...	...	...
	Begári Canals	248,357	15,156	263,513	5,24,781	50.201	5,74,982	10,999	15,931	26,930	5,48,052	54,805	4,93,247
	Shikárpur Canals ...	115,083	21,260	136,343	3,28,760	67,021	3,95,781	13	32	45	3,95,736	39,574	3,56,162
	Ghár Canals	371,093	106,939	478,032	11,79,179	3,67,379	15,46,558	73,329	29,577	1,02,906	14,43,652	1,44,365	12,99,287
	Eastern Nára	172,287	109,366	281,653	3,67,725	1,75,809	5,43,534	4,996	...	4,996	5,38,538	53,850	4,84,688
	Hyderabad Canals ...	337,758	27,467	365,225	7,50,737	68,397	8,19,134	8,774	43	8,817	8,10,317	81,032	7,29,285
	Fuleli Canals	249,126	49,790	298,916	6,06,302	1,09,658	7,15,960	30,862	56	30,918	6,85,042	68,502	6,16,540
	Karáchi Canals... ...	228,336	57,786	286,122	5,90,885	1,39,859	7,30,744	58,830	...	58,830	6,71,914	67,191	6,04,723
	Total ...	1,722,040	387,764	2,109,804	43,48,369	9,78,324	53,26,693	1,87,803	45,639	2,33,442	50,93,251	5,09,319	45,83,932

NOTE.—The figures in this table are based on assessments.

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE VII-A.

Compartive Statement showing increases or decreases under heads Kharíf and Rabi and Irrigation share of net consolidated Assessment for 1888-89 and 1889-90.

Names of Canals and Districts.	1888-89.			1889-90.			Results.		
	Cultivation.		Irrigation share of net consolidated Assessment.	Cultivation.		Irrigation share of net consolidated Assessment.	Cultivation.		Irrigation share of net consolidated Assessment.
	Kharíf.	Rabi.		Kharíf.	Rabi.		Kharíf.	Rabi.	
	Acres.	Acres.	Rs.	Acres.	Acres.	Rs.	Acres.	Acres.	Rs.
Begári Canals.. Desert Canal ...	62,584	6,591	1,24,214	77,340	5,437	1,48,221	+14,756	—1,154	+24,007
Unharwah ...	38,335	4,837	79,195	32,270	1,570	59,971	—6,065	—3,267	—19,224
Begári Canal ...	1,47,494	15,770	3,10,119	1,36,150	5,383	2,75,101	—11,344	—10,387	—35,018
Kashmor Bund...	1,314	2,311	6,634	2,597	2,766	9,954	+1,283	+455	+3,320
Shikárpur Canals. Canals in Rohri...	61,119	20,959	2,03,550	58,908	13,790	1,81,952	—2,211	—7,169	—21,598
Bunds in Rohri...	...	...	...	...	...	...	...	...	...
Sind Canal ...	49,833	5,222	1,51,586	56,175	7,470	1,74,210	+6,342	+2,248	+22,624
Sukkur-Begári Bund ...	...	...	...	...	...	...	...	...	...
Ghár Canals ... Sukkur Canal ...	63,322	19,351	1,95,914	63,886	24,401	2,10,821	+564	+5,050	+14,907
Ghár Canal ...	1,77,213	27,175	5,86,184	1,77,041	50,514	6,42,041	—172	+23,339	+55,857
Nára	1,16,323	14,845	4,02,556	1,21,462	29,863	4,18,924	+5,139	+15,018	+16,368
Wahur	5,505	661	15,570	5,713	1,014	16,789	+208	+353	+1,219
Marvi	3,106	996	10,406	2,991	1,147	10,712	—115	+151	+306
Bunds, right bank ...	29	26	95	...	...	...	—29	—26	—95
Eastern Nára Canals. Nára Supply Channel ...	926	2,112	7,683	409	6,314	16,442	—517	+4,202	+8,759
Eastern Nára Canal ..	29,514	8,793	52,003	21,540	64,554	1,08,001	—7,974	+55,761	+55,998
Mithrau	94,043	27,796	2,34,776	98,629	28,542	2,40,675	+4,586	—4,254	+5,899
Dimwah	3,076	73	5,310	8,688	639	16,939	+5,612	+566	+11,629
Heranwah	2,446	54	4,289	2,260	184	4,455	—186	+130	+166
Kipra Canal	...	...	...	4,472	1,650	7,672	+4,472	+1,650	+7,672
Thar Canal	33,521	11,346	85,153	36,289	12,483	90,504	+2,768	+1,137	+5,351
Hyderabad Canals. Mehrabwah	13,110	990	26,078	13,382	1,421	25,548	+272	+431	—530
Nasrat	20,378	2,260	53,202	21,444	4,227	59,266	+1,066	+1,967	+6,064
Naolakhi	47,170	3,888	1,14,691	47,788	4,965	1,16,927	+618	+1,077	+2,236
Dámbro	6,932	517	16,412	8,944	562	20,206	+2,012	+45	+3,794
Dad	23,543	1,382	52,464	24,267	2,099	54,291	+724	+717	+1,827
Ren	13,487	356	26,490	13,012	1,138	27,542	—475	+782	+1,052
Alibhar Kacheri ...	5,886	72	12,371	8,865	33	18,195	+2,979	—39	+5,824
Marak	40,226	518	88,508	45,353	544	99,840	+5,127	+26	+11,332
Gháro Mahmuda ...	46,689	2,249	97,091	50,991	4,211	1,12,178	+4,302	+1,962	+15,087
Kari Shumali ...	33,694	722	46,661	35,036	1,042	51,010	+1,342	+320	+4,349
Nasir	27,072	798	49,410	26,895	1,313	52,362	—177	+515	+2,952
Sarfraz	19,050	480	32,748	19,760	996	34,980	+710	+516	+2,232
Other canals	20,168	2,733	48,584	22,021	4,916	56,940	+1,853	+2,183	+8,556
Fuleli Canals... Fuleli	2,08,718	25,859	5,03,261	2,27,463	40,269	5,61,087	+18,745	+14,410	+57,826
Other canals	17,102	815	43,458	21,663	9,521	55,453	+4,561	+8,706	+11,995
Karáchi Canals. Nára	39,971	16,095	1,18,230	42,549	28,209	1,55,482	+2,578	+12,114	+37,252
Phitta	4,319	396	9,043	3,943	1,589	11,018	—376	+1,193	+1,975
Canals north of Kotri ...	12,919	1,491	28,089	13,909	3,861	35,882	+990	+2,370	+7,793
Kalri	9,760	900	22,864	10,179	1,569	24,616	+419	+669	+1,752
Baghar	16,856	2,011	38,715	16,206	6,645	48,381	—650	+4,634	+9,666
Uchita	9,819	516	19,211	8,825	1,005	19,366	—994	+489	+155
Canals in Tatta, &c. ...	10,687	687	19,839	9,036	1,444	18,014	—1,651	+757	—1,825
Shal Canal	2,548	473	6,494	2,664	301	7,498	+116	—1,712	+1,004
Pinyári	64,652	2,276	1,69,268	69,718	8,230	1,66,658	+5,066	+5,954	—2,610
Canals in Mirpur Batoro.	13,115	783	32,569	15,710	2,033	37,415	+2,595	+1,250	+4,846
Canals in Sujáwal ...	6,519	349	17,183	6,347	1,514	13,304	—172	+1,165	—3,879
Satta	8,343	215	17,327	9,077	466	18,317	+734	+251	+990
Canals in Jati	2,108	14	5,728	1,795	256	4,784	—313	+242	—944
Khanta	4,539	93	11,325	4,751	252	11,767	+212	+159	+442
Kokawari	8,109	102	19,776	12,010	335	28,290	+3,901	+233	+8,514
Canals in Shábandar ...	1,394	12	3,370	1,617	77	3,931	+223	+65	+561
Bunds, left bank ...	...	...	...	...	...	...	...	...	...
Bunds, right bank ...	...	...	...	...	...	...	...	...	...
Begári Canals	2,49,727	29,509	5,20,162	2,48,357	15,156	4,93,247	—1,370	—14,353	—26,915
Shikárpur Canals	1,10,952	26,181	3,55,136	1,15,083	21,260	3,56.162	+4,131	—4,921	+1,026
Ghár Canals	3,65,498	63,054	12,10,725	3,71,093	1,06,939	12,99,287	+5,595	+43,885	+88,562
Eastern Nára	1,63,526	50,174	3,89,214	1,72,287	1,09,366	4,84,688	+8,761	+59,192	+95,474
Hyderabad Canals	3,17,405	16,965	6,64,710	3,37,758	27,467	7,29,285	+20,353	+10,502	+64,575
Fuleli Canals...	2,25,820	26,674	5,46,719	2,49,126	49,790	6,16,540	+23,306	+23,116	+69,821
Karáchi Canals	2,15,658	26,413	5,39,031	2,28,336	57,786	6,04,723	+12,678	+31,373	+65,692
Total ...	16,48,586	2,38,970	42,25,697	17,22,040	3,87,764	45,83,932	+73,454	+1,48,794	+3,58,235

NOTE.—The figures in this table are based on assessments.

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE VII-B.

Statement showing Receipts from Sale of Occupancy Rights in Waste or other Lands not belonging to Major and Minor Works but directly benefited by their construction for the year 1889-90.

District.	Name of Irrigational Work.	Particulars of the Lands the Occupancy Rights of which were sold.				Amount of Receipts from Sale of Occupancy Rights.	Land Share 1/16.	Irrigation Share 15/16.	Sums to be credited as Indirect Revenue calculated at 4 per cent. on Irrigation share.	Remarks.
		Táluka.	Village.	Area.	Assessment.					
1	2	3	4	5	6	7	8	9	10	11
				Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	
Begári Canals ..	Desert Canal	The táluks are too numerous to mention in this column.	The villages also are too numerous to mention in this column.	5,239	..	4,582	458	4,124	165	
	Unharwah			9,908	..	7,932	793	7,139	286	
	Begári Canal			3,484	1,547	3,243	324	2,919	117	
	Kashmor Bund			4,113	..	6,065	607	5,458	218	
Shikárpur Canals ..	Canals in Rohri			2,867	3,308	17,013	1,701	15,312	611	
	Bunds in Rohri			..	..	..	..	..	..	
	Sind Canal			1,476	3,991	6,798	680	6,118	245	
	Sukkur-Begári Bund			..	..	..	..	..	..	
Ghár Canals ..	Sukkur Canal			333	572	1,135	114	1,021	41	
	Ghár do.			187	487	2,283	228	2,055	82	
	Nára do.			64	263	507	51	456	18	
	Wahur do.			..	..	..	..	..	..	
	Marvi do.			.. 6	..	.. 11	.. 1	.. 10	.. 1	
	Bunds, right bank			..	..	..	..	..	..	
Eastern Nára Canals..	Nára Supply Channel			5	35	252	25	227	9	
	Eastern Nára			..	..	..	..	..	..	
	Mithrau Canal			..	..	..	..	..	..	
	Dimwah			.. *1	1	1	..	1	..	*½ an acre but shown 1 in round figures.
	Heranwah			..	..	..	..	..	..	
	Kipra Canal			..	..	..	..	..	..	
	Thar Canal			..	..	..	..	..	..	
Hyderabad Canals ..	Mehrabwah			520	1,071	1,705	170	1,535	61	
	Nasrat			1,278	2,982	3,251	325	2,926	117	
	Naolakhi			1,416	2,774	2,967	297	2,670	107	
	Dámbro			915	2,110	2,316	232	2,084	83	
	Dadwah			1,260	2,793	2,581	258	2,323	93	
	Renwah			1,316	2,572	2,722	272	2,450	98	
	Alibhar Kacheri			1,449	3,017	2,230	223	2,007	80	
	Marak			3,153	7,148	5,621	562	5,059	202	
	Gháro Mahmuda			3,836	3,807	3,485	349	3,136	125	
	Kari Shummali			10,542	6,783	8,994	899	8,095	324	
	Nasirwah			5,150	3,116	3,516	352	3,164	127	
	Sarfrazwah			4,657	5,343	5,044	504	4,540	182	
	Other canals			1,295	2,820	2,381	238	2,143	86	
Fuleli Canals ..	Fuleli			9,596	18,823	15,100	1,510	13,590	543	
	Other canals			111	278	279	28	251	10	
Karáchi Canals ..	Nára			1,300	1,635	4,571	457	4,114	165	
	Phitta			369	655	1,406	140	1,266	51	
	Canals north of Kotri			794	1,163	1,442	144	1,298	52	
	Kalri			203	575	86	9	77	3	
	Baghar			413	836	188	19	169	7	
	Uchita			..	..	91	9	82	3	
	Canals in Tatta, &c.			29	67	51	5	46	1	
	Shal Canal			..	..	..	..	..	..	
	Pinyári			752	2,108	2,957	296	2,661	106	
	Canals in Mirpur Batoro			215	546	1,001	100	901	36	
	Canals in Sujáwal			71	178	272	27	245	10	
	Satta			..	..	8	1	7	..	
	Canals in Jati			51	..	†	..	..	..	†Revenue Department has shown no receipts.
	Khanta			..	..	16	2	14	1	
	Kokawari			87	205	126	13	113	5	
	Canals in Shahbandar			..	..	..	..	..	...	
	Bunds, left bank			..	..	..	..	..	...	
	Bunds, right bank			..	..	..	..	..	...	
Begári Canals ..		..	..	22,744	1,547	21,822	2,182	19,640	786	
Shikárpur Canals		..	..	4,343	7,299	23,811	2,381	21,430	856	
Ghár Canals ..		..	..	590	1,322	3,936	394	3,542	142	
Eastern Nára ..		..	..	16	36	253	25	228	9	
Hyderabad Canals		..	..	36,787	46,336	46,813	4,681	42,132	1,685	
Fuleli Canals ..		..	..	9,707	19,101	15,379	1,538	13,841	553	
Karáchi Canals		..	..	4,344	7,968	12,215	1,222	10,993	440	
	Total ..	..	..	78,531	83,609	1,24,229	12,423	1,11,806	4,471	

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE VIII.

Discharges of certain Canals, Areas of Crops of different kinds irrigated, and Duty of Water per cubic foot of Supply for Kharif Season, 1889.

Canals and Executive Charges.			Average Discharge per cubic foot per second.	Areas of Land irrigated.				Area of Land irrigated.		Total Area irrigated.	Area irrigated per cubic foot of Supply.
				Jowári.	Bájri.	Rice.	Other crops.	By Lift.	By Flow.		
Upper Sind Frontier.	Begári Canals	Desert Canal	2,608	88,027	6,328	146	19,166	14,005	99,662	113,667	43·58
		Muradwah	460	8,803	1,649	171	5,455	1,398	14,680	16,078	34·95
		Unharwah	950	23,068	3,060	382	7,384	5,398	28,496	33,894	35·68
		Begári Canal	4,110	1,14,879	7,439	12,078	59,629	36,373	157,652	194,025	47·21
Shikárpur Collectorate.	Shikárpur Canals	Sind Canal	1,792	30,788	607	23,125	5,876	13,897	46,499	60,396	33·70
	Ghár Canals	Sukkur Canal	2,433	23,238	912	27,173	12,563	9,536	54,350	(a) 63,886	27·01
		Ghár Canal	5,053	70,027	3,549	97,676	5,789	3,562	173,479	(b) 177,041	36·57
Thar and Párkar	Eastern Nára	Mithrau	2,308	591	20,371	58,370	19,297	23,730	74,899	98,629	42·73
		Thar Canal	922	7	6,287	25,827	4,168	3,609	32,080	36,289	39·36
Hyderabad Collectorate.	Hyderabad Canals	Mehrabwah	45,606	8,121	2,888	49	2,518	11,899	1,677	13,576	29·76
		Nasrat	57,533	15,584	1,443	229	4,745	14,618	7,383	22,001	38·23
		Naolakhi	120,318	32,013	4,867	559	12,877	37,081	13,235	50,316	41·83
		Marak	116,912	4,693	27,347	22	19,622	50,673	1,011	51,684	44·20
		Ghalu	85,162	1,964	26,082	..	16,019	43,921	144	44,065	51·74
		Nasir	57,089	1,149	19,523	3	8,264	28,934	5	28,939	50·70
		Sarfraz	46,156	771	17,859	..	6,150	23,949	831	24,780	53·70
	Fuleli Canals	Fuleli	9,661	7,096	91,183	1,50,339	28,722	1,02,603	174,737	(c) 277,340	28·71
		Imamwah	201	175	5,802	2,226	1,550	6,904	2,849	(d) 9,753	48·52
		Sanhi Guni	303	280	983	6,935	116	36	8,278	(e) 8,314	27·44
		Sherwah	130	90	172	2,099	82	45	2,398	(f) 2,443	18·79
		Aliwah	159	214	148	3,274	58	..	3,694	(g) 3,694	23·23

Note.—(a) Exclusive of 1,841 acres of Jaghir area.
(b) Do. 7,774 do.
(c) Includes 49,878 do.
(d) Do. 1,696 do.
(e) Do. 242 do.
(f) Do. 8 do.
(g) Do. 6 do.

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

ABSTRACT.

	Acres.	
Jowári	4,31,578	
Bájri	2,48,499	
Rice	4,10,683	
Other crops	2,40,050	
		13,30,810
By lift	4,32,171	
By flow	8,98,639	
		13,30,810

To be substituted for Table VIII at page 43 of Annual Irrigation Revenue Report, Sind, 1888-89.

REVISED TABLE VIII.

Discharge of certain canals, areas of crops of different kinds irrigated, duty of water per cubic foot of supply, for Kharif season, 1888.

Canals and Executive Charges.			Average discharge per cubic foot per second.	Area of land irrigated.				Area of land irrigated.		Total area irrigated.	Area irrigated per cubic foot of supply.
				Jowári.	Bájri.	Rice.	Other Crops.	By lift.	By flow.		
Upper Sind Frontier.	Begári Canals.	Desert Canal ...	1,871	67,146	5,292	74	27,735	10,609	89,638	1,00,247	53·58
		Muradwah	395	5,835	1,481	123	6,773	414	13,798	14,212	36·00
		Unharwah	1,059	22,037	2,287	158	18,727	4,170	39,039	43,209	40·80
		Begári Canal ...	4,040	1,02,377	5,517	7,989	89,950	35,832	1,70,001	2,05,833	50·95
Shikárpur Collectorate.	Shikárpur Canals.	Sind Canal	1,431	22,959	307	21,523	6,619	11,817	39,591	51,408	35·92
	Ghár Canals.	Sukkur Canal ...	1,779	20,381	458	24,454	18,029	10,258	53,064	63,322	35·86
		Ghár Canals ...	4,353	89,995	4,279	60,169	22,771	4,951	1,72,263	1,77,214	42·32
	Eastern Nàra.	Mitrao	2,197	472	17,525	56,561	19,486	16,219	77,825	94,044	42·80
		Thar Canal... ...	920	33	5,931	26,358	3,030	744	34,608	35,352	38·43
Hyderabad Collectorate.	Hyderabad Canals.	Mehrabwah... ...	412	8,920	2,284	27	2,035	12,151	1,115	13,266	32·20
		Nasrat	414	15,091	872	163	4,750	15,033	5,843	20,876	50·42
		Naolakhi	988	29,392	4,550	581	14,904	37,509	11,918	49,427	50·03
		Márak	1,169	4,220	24,451	21	17,878	45,273	1,297	46,570	39·84
		Ghalu	607	2,245	24,984	...	15,411	42,559	81	42,640	70·25
		Nasir	385	947	19,862	55	8,822	29,621	65	29,686	77·11
		Sarfraz	343	508	16,985	14	6,550	23,501	556	24,057	47·36
	Fuleli Canals.	Fuleli	7,691	4,716	71,601	158,371	24,397	88,993	1,70,092	2,59,085	33·68
		Inamwah	233	64	4,519	2,935	1,411	5,422	3,507	8,929	38·32
		Sanhi Guni	202	126	281	5,428	508	9	6,334	6,343	31·40
		Sherwah	100	61	86	2,467	293	7	2,900	2,907	29·07
		Aliwah	99	99	47	3,959	692	...	4,797	4,797	48·00
		Total ...	...	3,97,624	2,13,599	3,71,430	3,10,771	3,95,092	8,98,332	12,93,424	...

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

TABLE IX

Rainfall in the Province of Sind for 1889-90.

Collectorate and Districts.			April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Total.
			In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.	In. ct.
Upper Sind.	Begári Canals.	Jacobabad ...	1 21	...	...	1 6	2 85	...	...	...	...	...	...	0 2	5 14
		Kashmor ...	0 13	...	2 24	2 24	6 16	...	...	...	...	...	...	0 20	10 97
		Thul	0 70	...	1 50	0 43	0 70	...	...	...	...	...	...	...	3 33
		Shahdádpur ...	0 11	...	...	...	1 80	...	...	...	...	...	...	...	1 91
Shikárpur Collectorate.	Shikárpur Canals.	Ubauro	0 10	...	...	0 8	1 14	...	...	...	...	...	0 12	...	1 44
		Mirpur	...	...	0 14	0 19	0 71	...	...	...	...	...	0 6	...	1 10
		Ghotki	0 15	...	0 30	0 3	0 95	...	...	...	...	...	0 8	0 6	1 57
		Rohri	0 35	...	...	0 32	1 94	...	...	...	...	...	0 10	...	2 71
		Shikárpur ...	1 4	0 2	...	..	3 90	...	...	...	...	...	0 4	0 3	5 3
		Sukkur	0 55	...	...	0 45	1 75	...	...	...	...	...	0 8	...	2 83
		Garhi Yásin ...	1 28	...	...	0 1	2 2	...	...	...	...	...	0 5	0 4	3 40
		Rato-dero ...	...	0 51	...	...	2 77	...	...	...	...	...	...	...	3 28
	Ghár Canals.	Lárkhána ...	...	...	...	1 62	1 65	...	...	...	...	...	0 4	...	3 41
		Kambar	0 3	0 10	0 70	...	1 65	...	...	...	...	...	0 5	...	2 53
		Bákráni	...	...	...	...	2 98	...	...	...	...	...	...	...	2 98
		Mehar	...	...	...	0 63	4 19	...	...	...	...	...	0 6	0 6	4 94
		Warah	...	...	...	0 5	1 0	...	...	...	...	...	...	0 7	5 8
		Khairpur Náthe-shah	...	0 5	...	...	3 60	...	...	...	...	...	0 8	0 12	3 85
Thar and Párkar.	Eastern Nára Canals.	Nagar	0 10	1 27	0 55	3 57	2 18	0 13	...	...	...	...	...	...	7 80
		Mitti	...	...	0 26	4 7	1 82	1 30	...	...	...	...	...	...	7 45
		Umarkot ...	...	...	...	2 74	2 68	...	...	...	...	...	...	...	5 42
		Kipra	...	...	0 6	1 43	3 64	...	...	...	...	...	...	...	5 13
Hyderabad Collectorate.	Hyderabad Canals.	Kandiáro ...	...	...	...	1 54	3 14	...	...	...	...	...	...	...	4 68
		Naushahro ...	...	...	0 50	0 20	3 0	...	...	...	...	...	0 5	...	3 75
		Tháru Shah ...	...	...	...	0 20	2 73	...	...	...	...	...	0 3	...	2 96
		Moro	0 5	0 24	0 89	0 28	2 20	...	...	...	...	...	...	...	3 66
		Sákrand	0 30	...	1 1	1 30	2 72	...	...	...	...	...	...	...	5 33
		Hála	...	0 35	0 3	..	3 85	...	...	...	...	...	...	...	4 23
		Shahdadpur ...	...	...	...	0 57	1 62	...	...	...	...	...	...	...	2 19
		Tando Adam ...	...	...	0 30	1 20	3 61	...	...	...	...	...	...	...	5 11
		Tando Alahyár...	...	...	0 10	1 71	3 71	...	...	...	...	...	...	...	5 52
		Mirpur Khás ...	...	...	0 14	4 46	2 62	...	...	...	...	...	...	...	7 22
	Fuleli Canals.	Hyderabad ...	0 20	0 60	0 5	0 36	0 96	...	...	...	...	...	...	...	2 17
		Mohobat Dero ...	...	...	0 23	3 44	7 13	...	...	...	...	...	...	...	10 80
		Tando Bágo ...	...	...	0 2	7 13	2 16	...	...	...	...	...	...	...	9 31
		Badin	...	...	...	4 94	2 85	...	...	..	..	...	..	...	7 79
		Tando Muhammad Khán ...	...	0 20	0 10	1 95	5 80	...	...	...	...	...	...	...	8 5
Karáchi Collectorate.	Karáchi Canals.	Dádú	0 9	...	0 82	0 25	2 86	...	...	...	...	...	0 5	...	4 7
		Johi	...	...	0 50	0 5	2 46	...	...	...	...	...	0 8	...	3 9
		Sehwan	...	0 12	0 45	1 91	3 27	..	...	...	...	...	...	0 3	5 78
		Mánjhand ...	...	...	0 42	1 70	1 60	...	...	...	...	...	...	...	3 72
		Kotri	...	0 67	0 6	0 56	1 62	...	...	...	...	...	...	..	2 91
		Bula Khán's Tandó	...	0 45	0 25	1 12	1 40	...	...	...	...	...	0 1	...	3 23
		Jerruk	...	0 8	0 8	0 56	2 30	...	...	...	...	...	...	...	3 2
		Tatta	...	0 1	0 44	0 45	1 8	...	...	...	...	...	...	...	1 98
		Sákro	...	...	0 60	1 19	1 82	...	...	...	...	...	...	...	3 61
		Mirpur Batoro ...	...	...	0 20	1 86	2 13	...	...	...	...	...	...	...	4 19
		Sujáwal	...	...	0 94	1 23	1 17	0 80	...	...	...	...	...	...	4 14
		Shábbandar ...	...	...	1 11	2 63	0 83	...	...	...	...	...	0 6	...	4 63
		Kotri, Ghorábári.	...	...	0 90	0 50	0 98	...	...	..	...	...	...	...	2 38
		Keti	...	...	1 25	5 16	1 4	...	...	...	0 6	...	...	...	7 51
		Mugalbin ...	...	...	1 0	3 9	1 77	0 5	...	...	...	...	...	...	5 91
		Karáchi	...	...	0 79	1 5	1 35	...	...	...	0 7	..	0 3	...	3 29

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

Memorandum showing the amount of Loss to Canals on account of difference on Jághir Lands and the Assessments at the ordinary rates in force for Government Lands.

	To end of 1888-89.	During 1889-90.	To end of 1889-90.	Remarks.
	Rs.	Rs.	Rs.	
MAJOR WORKS.				
Productive Works.				
Desert Canal	1,86,368	35,997	2,22,365	
Begári Canal	2,89,061	44,928	3,33,989	
Eastern Nára Works	31,929	6,867	38,796	
Total ...	5,07,358	87,792	5,95,150	
MINOR WORKS AND NAVIGATION.				
Works for which Capital and Revenue Accounts are kept.				
Sukkur Canal	22,443	5,910	28,353	
Ghár Canal	1,19,546	28,468	1,48,014	
Mehrabwah	1,253	616	1,869	
Alibhar Kacheri Canal	20,691	2,903	23,594	
Márak Great Canal	1,14,390	14,510	1,28,900	
Sarfrazwah	55,776	9,626	65,402	
Fuleli Canal	9,88,317	1,21,042	11,09,359	
Total ...	13,22,416	1,83,075	15,05,491	
Works for which only Revenue Accounts are kept.				
Under Executive Engineer, Shikárpur Canals	...	23,887	...	
,, ,, Ghár do.	...	21,454	...	
,, ,, Hyderabad do.	...	70,634	...	
,, ,, Fuleli do.	...	2,521	...	
,, ,, Karáchi do.	...	35,763	...	
Total ...	...	1,54,259	...	

R. C. F. VOLKERS,
for Examiner, Public Works Accounts.

STATEMENT No. I.-B.

Capital Account of Irrigation Works in Sind for and to end of 1889-90.

	Name of Work.	During Year.										To end of Year.									
		Direct Charges.						Indirect Charges.			Grand Total.	Direct Charges.						Indirect Charges.			Grand Total.
		Works.	Establishment.	Tools and Plant.	Total.	Deduct Receipts on Capital Account.	Total.	Capitalization.	Leave and Pension Allowances.	Total.		Works.	Establishment.	Tools and Plant.	Total.	Deduct Receipts on Capital Account.	Total.	Capitalization.	Leave and Pension Allowances.	Total.	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	MAJOR WORKS.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
	PRODUCTIVE WORKS.																				
	In Operation.																				
1	Desert Canal ...	2,156	432	...	2,588	...	2,588	...	60	60	2,648	9,82,895	2,19,876	14,280	12,17,051	37	12,17,014	...	40,507	40,507	12,57,521
2	Unharwah	...	...	...	...	...	...	...	...	...	...	2,79,267	52,087	481	3,31,835	...	3,31,835	...	7,293	7,293	3,39,128
3	Begári Canal ...	...	...	...	...	...	...	...	...	...	...	13,91,068	2,29,894	4,666	16,25,628	19	16,25,609	4,246	43,224	47,470	16,73,079
4	Eastern Nára Works.	58,506	14,626	1,083	74,215	...	74,215	...	2,048	2,048	76,263	40,12,005	9,96,772	42,665	50,51,442	176	50,51,266	2,669	1,83,641	1,86,310	52,37,576
	Total, Major Works...	60,662	15,058	1,083	76,803	...	76,803	...	2,108	2,108	78,911	66,65,235	14,98,629	62,092	82,25,956	232	82,25,724	6,915	2,74,665	2,81,580	85,07,304
	MINOR WORKS AND NAVIGATION.																				
	In Operation.																				
5	Sukkur Canal ...	...	...	...	...	...	...	...	...	...	...	11,10,106	2,05,471	13,330	13,28,907	160	13,28,747	19,775	40,191	59,966	13,88,713
6	Ghár Canal	..	...	...	...	...	...	...	...	...	...	3,38,237	75,554	1,746	4,15,537	...	4,15,537	10,329	15,111	25,440	4,40,977
7	Mehrabwah	...	...	...	...	...	...	...	...	...	...	52,797	13,199	22	66,018	...	66,018	...	1,851	1,851	67,869
8	Alibhar Kacheri Canal	...	...	...	...	...	...	...	...	...	...	19,636	3,548	23	23,207	...	23,207	...	710	710	23,917
9	Marak Great Canal...	...	...	...	...	...	...	...	...	...	...	1,59,516	32,719	1,445	1,93,680	80	1,93,600	1,409	6,544	7,953	2,01,553
10	Sarfrazwah	...	...	...	...	...	...	...	...	...	...	1,03,432	15,097	30	1,18,559	...	1,18,559	3,102	3,019	6,121	1,24,680
11	Fuleli Canal	45,144	9,029	...	54,173	...	54,173	...	1,264	1,264	55,437	8,63,833	1,76,343	651	10,40,827	21	10,40,806	6,401	34,159	40,560	10,81,366
	Total, Minor Works and Navigation ...	45,144	9,029	...	54,173	...	54,173	...	1,264	1,264	55,437	26,47,557	5,21,931	17,247	31,86,735	261	31,86,474	41,016	1,01,585	1,42,601	33,29,075
	Grand Total ...	1,05,806	24,087	1,083	1,30,976	...	1,30,976	...	3,372	3,372	1,34,348	93,12,792	20,20,560	79,339	1,14,12,691	493	1,14,12,198	47,931	3,76,250	4,24,181	1,18,36,379

R. C. F. VOLKERS,
for Examiner, Public Works Accounts.

STATEMENT No. I-C.

Statement showing the Financial Results of Irrigation Works in Sind for the year ending 31st March 1890.
Realizations under main heads of Revenue and Working Expenses.

Name of Work.	Revenue (actual Receipts).									Working Expenses.																Net Revenue.
	Irrigation.			Navigation.	Plantations.	Water-power.	Miscellaneous.	Total.	Refunds of Revenue.	Gross Revenue less Refunds.	Revenue Management.					Maintenance and Repairs.									Indirect Charges.	Grand Total Working Expenses.	
	Water-rates directly paid.	Share of Land Revenue.	Total.								Establishment.				Total Revenue Management.	Establishment.								Total Cost of Maintenance.			
											Direction.	Executive.	Navigation.	Civil Officers.		Direction.	Executive.	Medical.	Total.	Works.	Repairs.	Sundries.	Tools and Plant.	Plantations.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Major Works.	Rs.	Rs.	Rs.		Rs.		Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Works.																											
1 Desert Canal	51,768	1,45,693	1,97,461	...	...	...	167	1,97,628	...	1,97,628	...	...	...	15,634	15,634	1,522	3,986	...	5,508	...	29,798	2	317	135	35,760	931	52,325	1,45,303
2 Unharwah	...	46,651	46,651	...	1	...	26	46,678	...	46,678	...	...	...	4,540	4,540	480	1,210	...	1,690	...	9,373	...	93	70	11,226	237	16,003	30,675
3 Begári Canal	43,655	249,842	2,93,497	...	98	...	290	2,93,885	...	2,93,885	...	...	...	26,008	26,008	3,196	8,126	...	11,322	...	62,880	...	485	...	74,687	1,745	1,02,440	1,91,445
4 Eastern Nára Works	1,830	4,77,981	4,79,811	...	1,662	...	14,042	4,95,515	...	4,95,515	756	8,300	...	48,897	57,953	1,852	20,335	...	22,187	1,508	49,267	...	65	577	73,604	4,374	1,35,931	3,59,584
Total, Major Works ...	97,253	9,20,167	10,17,420	...	1,761	...	14,525	10,33,706	...	10,33,706	756	8,300	...	95,079	1,04,135	7,050	33,657	...	40,707	1,508	1,51,318	2	960	782	1,95,277	7,287	3,06,699	7,27,007
Minor Works and Navigation.																											
5 Sukkur Canal	245	1,39,338	1,39,583	...	204	...	1,373	1,41,160	...	1,41,160	...	...	..	13,938	13,938	989	2,624	...	3,613	...	19,455	...	59	...	23,127	506	37,571	1,03,589
6 Ghar do.	2,205	5,24,105	5,26,310	...	1,695	...	3,920	5,31,925	...	5,31,925	...	...	...	52,864	52,864	3,818	9,964	...	13,782	12,697	62,769	...	58	...	89,306	3,146	1,45,316	3,86,609
7 Mehrabwah...	1	25,781	25,782	...	...	...	180	25,962	...	25,962	...	...	...	2,555	2,555	730	2,246	...	2,976	...	14,293	...	50	50	17,369	417	20,341	5,621
8 Alibhar Kacheri Canal	549	9,848	10,397	...	38	...	...	10,435	...	10,435	...	...	...	1,032	1,032	210	645	...	855	...	4,118	...	14	...	4,987	120	6,139	4,296
9 Marak Great Canal	1,838	63,583	65,421	...	209	...	78	65,708	...	65,708	...	...	...	6,522	6,522	757	2,331	...	3,088	...	14,883	...	52	...	18,023	432	24,977	40,731
11 Surfrazwah	1,885	24,007	25,892	...	371	...	70	26,333	...	26,333	...	...	...	2,571	2,571	861	2,652	...	3,513	...	16,933	...	58	...	20,504	492	23,567	2,766
11 Fuleli Canal	23,159	4,31,989	4,55,148	...	1,773	...	2,273	4,59,194	...	4,59,194	...	...	...	45,460	45,460	9,750	20,634	...	30,384	...	1,92,237	...	1	...	2,22,622	4,254	2,72,336	1,86,858
Total, Minor Works and Navigation ...	29,882	12,18,651	12,48,533	...	4,290	...	7,894	12,60,717	...	12,60,717	...	...	...	1,24,942	1,24,942	17,115	41,096	...	58,211	12,697	3,24,688	...	292	50	3,95,938	9,367	5,30,247	7,30,470
Grand Total ...	1,27,135	21,38,818	22,65,953	...	6,051	...	22,419	22,94,423	...	22,94,423	756	8,300	...	2,20,021	2,29,077	24,165	74,753	...	98,918	14,205	4,76,006	2	1,252	832	5,91,215	16,654	8,36,946	14,57,477

* Including 4 per cent. on ⅘ proceeds from sale of occupancy rights in lands.

R. C. F. VOLKERS,
for Examiner, Public Works Accounts.

STATEMENT No. II-C.

Statement showing the Financial Results of Irrigation Works in Sind for the year 1889-90, based on actual Receipts—Principal Results of operations for the year ended 31st March 1890.

	Irrigation Works.	Direct and Indirect Capital Outlay to end of 1889-90.	Gross Receipts, Direct and Indirect, from all sources.	Working Expenses, Direct and Indirect.	Net Revenue (excluding charges for Interest).	Interest at 4 per cent. on Direct Capital Outlay at commencement of year and at 2 per cent. on Outlay during year.	Surplus Revenue after paying Interest on Direct Capital Outlay.		Excess Charges, including Interest on Direct Capital Outlay.	
							Amount.	Percentage on total sum at charge.	Amount.	Percentage on total sum at charge.
	1	2	3	4	5	6	7	8	9	10
	MAJOR WORKS.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
	Productive Works.									
	In Operation.									
1	Desert Canal	12,57,521	1,97,628	52,325	1,45,303	48,629	96,674	17·59	.....	.....
2	Unharwah	3,39,128	46,678	16,003	30,675	13,273	17,402	6·71	.....	.....
3	Begári Canal	16,73,079	2,93,885	1,02,440	1,91,445	65,024	1,26,421	23·13	.....	.....
4	Eastern Nára Works ...	52,37,576	4,95,515	1,35,931	3,59,584	2,00,566	1,59,018	2·64	.....	.....
	Total, Major Works ...	85,07,304	10,33,706	3,06,699	7,27,007	3,27,492	3,99,515	5·42	.....	.....
	Minor Works and Navigation.									
	In Operation.									
5	Sukkur Canal	13,88,713	1,41,160	37,571	1,03,589	53,150	50,439	2·22	.....	.....
6	Ghár Canal	4,40,977	5,31,925	1,45,316	3,86,609	16,621	3,69,988	(a)	.....	.....
7	Mehrabwah	67,869	25,962	20,341	5,621	2,641	2,980	7·54	.....	.....
8	Alibhar Kacheri Canal ...	23,917	10,435	6,139	4,296	928	3,368	7·25	.....	.....
9	Marak Great do. ...	2,01,553	65,708	24,977	40,731	7,744	32,987	(a)	.....	.....
10	Surfrazwah	1,24,680	26,333	23,567	2,766	4,742	.....	.....	1,976	1·14
11	Fuleli Canal	10,81,366	4,59,194	2,72,336	1,86,858	40,549	1,46,309	33·07	.....	.....
	Total, Minor Works and Navigation	33,29,075	12,60,717	5,30,247	7,30,470	1,26,375	6,04,095	(a)	.....	.....
	Grand Total ...	1,18,36,379	22,94,423	8,36,946	14,57,477	4,53,867	10,03,610	37·00	.....	.....

(a) The total sum at charge being minus, no percentage can be calculated.

R. C. F. VOLKERS,
for Examiner, Public Works Accounts.

STATEMENT No. III-C.

Demands and Realizations during the year 1 89-90 in Sind.

Irrigation Works.	Balance of Demands unrealized at commencement of year.	Demands of the Year.				Total, including Balance at commencement of year.	Deduct Remissions not including Cash Refunds.	Net Total.	Deduct amount unrealized at close of year.	Actual Realizations of the year.
		Kharif, 1889-90.	Rábi, 1889-90.	Miscellaneous Receipts.	Total.					
1	2	3	4	5	6	7	8	9	10	11
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
MAJOR WORKS.										
Productive Works.										
1. Desert Canal...	12,125	40,924	3,818	167	44,909	57,034	877	56,157	4,222	51,935
2. Unharwah	.....	...	...	27	27	27	...	27	..	27
3. Begári Canal	14,833	29,446	9,068	388	38,902	53,735	711	63,024	8,981	44,043
4. Eastern Nára Works	1,383	864	720	15,704	17,288	18,671	...	18,671	1,137	17,534
Total, Major Works ...	28,341	71,234	13,606	16,286	1,01,126	1,29,467	1,588	1,27,879	14,340	1,13,539
MINOR WORKS AND NAVIGATION.										
5. Sukkur Canal	124	965	61	1,577	2,603	2,727	...	2,727	905	1,822
6 Ghár do.	372	2,680	273	5,615	8,568	8,940	...	8,940	1,120	7,820
7. Mehrabwah	1	...	...	180	180	181	...	181	...	181
8. Alibhar Kacheri Canal	113	437	...	38	475	588	...	588	1	587
9. Márak Great Canal	—85	2,147	43	287	2,477	2,392	...	2,392	267	2,125
10. Surfrazwah	181	1,625	20	441	2,086	2,267	...	2,267	—59	2,326
11. Fuleli Canal	2,970	22,754	679	4,046	27,479	30,449	...	30,449	3,244	27,205
Total, Minor Works and Navigation ...	3,676	30,608	1,076	12,184	43,868	47,544	...	47,544	5,478	42,066
Grand Total ...	32,017	1,01,842	14,682	28,470	1,44,994	1,77,011	1,588	1,75,423	19,818	1,55,605

R. C. F. VOLKERS,
for Examiner, Public Works Accounts.

STATEMENT No. IV-C.

Statement showing the Financial Results of Irrigation Works in Sind for the year ended 1889-90 based on the Assessment of the year— Principal Results and Operations for the year ended 31st March 1890.

Irrigation Works.	Capital Outlay (Direct and Indirect) to end of year.	Revenue assessed during the year.									Working Expenses, direct and indirect.	Net assessed Revenue of the year.	Percentage on Capital Outlay to end of year.
		Direct assessed Revenue.							Indirect Revenue—(Land Revenue due to operation of Canal).*	Grand Total.			
		Occupier's rate.	Owner's rate.	Plantations.	Water-power.	Navigation.	Miscellaneous.	Total.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14
MAJOR WORKS.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	*Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive Works.													
1. Desert Canal	12,57,521	44,742	...	...	...	...	167	44,909	1,49,156	1,94,065	52,325	1,41,740	11·27
2. Unharwah	3,39,128	...	...	1	...	...	26	27	61,222	61,249	16,003	45,246	13·34
3. Begári Canal	16,73,079	38,514	...	98	...	...	290	38,902	2,54,247	2,93,149	1,02,440	1,90,709	11·40
4. Eastern Nára Works ...	52,37,576	1,584	...	1,662	...	...	14,042	17,288	4,81,253	4,98,541	1,35,931	3,62,610	6·92
Total, Major Works ...	85,07,304	84,840	...	1,761	...	...	14,525	101,126	9,45,878	10,47,004	3,06,699	7,40,305	8·70
Minor Works and Navigation.													
5. Sukkur Canal	13,88,713	1,026	...	204	...	...	1,373	2,603	1,39,516	1,42,119	37,571	1,04,548	7·53
6. Ghár Canal	4,40,977	2,953	...	1,695	...	...	3,920	8,563	5,25,410	5,33,978	1,45,316	3,88,662	88·14
7. Mehrabwah	67,869	...	...	...	...	...	180	180	25,781	25,961	20,341	5,620	8·28
8. Alibhar Kacheri Canal ...	23,917	437	...	38	...	...	...	475	9,848	10,323	6,139	4,184	17·49
9. Márak Great Canal	2,01,553	2,190	...	209	...	...	78	2,477	63,583	66,060	24,977	41,083	20·38
10. Surfrazwah	1,24,680	1,645	...	371	...	...	70	2,086	24,007	26,093	23,567	2,526	2·03
11. Fuleli Canal	10,81,366	23,433	...	1,773	...	...	2,273	27,479	4,31,347	4,58,826	2,72,336	1,86,490	17·25
Total, Minor Works and Navigation	33,29,075	31,684	...	4,290	...	...	7,894	43,868	12,19,492	12,63,360	5,30,247	7,33,113	22·02
Grand Total ...	1,18,36,379	1,16,524	...	6,051	...	...	22,419	1,44,994	21,65,370	23,10,364	8,36,946	14,73,418	12·45

* Incuding 4 per cent. on $\frac{8}{10}$ proceeds from sale of occupancy rights in land.

R. C. F. VOLKERS,
for Examiner, Public Works Accounts.

General Abstract of Financial Results of Irrigation

	WORKS IN									
	MAJOR WORKS—PRODUCTIVE WORKS.					MINOR WORKS AND NAVIGATION—WORKS FOR WHICH CAPITAL				
	Desert Canal.	Unharwah.	Begári Canals.	Eastern Nára Works.	Total.	Sukkur Canal.	Ghár Canal.	Mehrabwah.	Alibhar Kacheri Canal.	Márak Great Canal.
Capital Outlay.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
During year ... Direct ...	2,588	...	...	74,215	76,803	...	.....	...	...	...
During year ... Indirect ...	60	...	...	2,048	2,108	...	.....	...	...	...
Total ..	2,648	...	...	76,263	78,911	...	.....	...	...	...
To end of year ... Direct ...	12,17,014	3,31,835	16,25,609	50,51,266	82,25,724	13,28,747	4,15,537	66,018	23,207	1,93,600
To end of year ... Indirect ...	40,507	7,293	47,470	1,86,310	2,81,580	59,966	25,440	1,851	710	7,953
Total ...	12,57,521	3,39,128	16,73,079	52,37,576	85,07,304	13,88,713	4,40,977	67,869	23,917	2,01,553
Gross Revenue.										
During year ... Direct ...	51,935	27	44,043	17,534	1,13,539	1,822	7,820	181	587	2,125
During year ... Indirect ...	1,45,693	46,651	2,49,842	4,77,981	9,20,167	1,39,338	5,24,105	25,781	9,848	63,583
Total ...	1,97,628	46,678	2,93,885	4,95,515	10,33,706	1,41,160	5,31,925	25,962	10,435	65,708
To end of year ... Direct ...	2,90,197	143	3,35,822	5,77,250	12,03,412	1 6,591	1,98,978	1,174	11,322	52,248
To end of year ... Indirect ...	(a)16,17,638	(b)2,45,047	(c)40,40,357	51,84,164	1,10,87,206	(d)10,92,403	(e)1,19,78,639	(f)1,55,194	1,03,750	8,12,859
Total ...	19,07,835	2,45,190	43,76,179	57,61,414	1,22,90,618	11,08,994	1,21,77,617	1,56,368	1,15,072	8,65,107
Working Expenses.										
During year ... Direct ...	51,394	15,766	1,00,695	1,31,557	2,99,412	37,065	1,42,170	19,924	6,019	24,545
During year ... Indirect ...	931	237	1,745	4,374	7,287	506	3,146	417	120	432
Total ...	52,325	16,003	1,02,440	1,35,931	3,06,699	37,571	1,45,316	20,341	6,139	24,977
To end of year ... Direct ...	5,29,104	81,327	19,35,130	25,83,203	51,78,764	8,74,287	34,75,700	1,03,586	1,15,598	2,97,111
To end of year ... Indirect ...	14,979	1,780	52,948	1,13,396	1,83,103	25,227	81,337	2,281	3,285	7,742
Total ...	5,44,083	83,107	20,38,078	26,96,599	53,61,867	8,99,514	35,57,037	1,05,867	1,18,883	3,04,853
Net Revenue.										
During year	1,45,303	30,675	1,91,445	3,59,584	7,27,007	1,03,589	3,86,609	5,621	4,296	40,731
To end of year	13,63,752	1,62,083	23,38,101	30,64,815	69,28,751	2,09,480	86,20,590	50,501	— 3,811	5,60,254
Simple Interest.										
During year	48,629	13,273	65,024	2,00,566	3,27,492	...	.....	...	...	...
To end of year	5,59,076	65,025	10,85,193	36,87,084	53,96,378	...	.....	...	...	...
Net profit after paying off Interest.										
During year	96,674	17,402	1,26,421	1,59,018	3,99,515	...	.....	...	...	...
To end of year	8,04,676	97,058	12,52,908	—6,22,269	15,32,373	...	.....	...	...	...

NOTES.—(1) The Indirect Revenue to end of year includes (*a*) Rs. 1,969, (*b*) Rs. 2,326, (*c*) Rs. 9,489, (*d*) Rs. 204, (*e*) Rs. 118 and (*f*) Rs. 172

(2) The Refunds of Revenue are deducted from the Direct Gross Revenue and not added to the Direct Working Expenses

Works in Sind for and up to the close of 1889-90.

OPERATION.

AND REVENUE ACCOUNTS ARE KEPT.			Grand Total.	MINOR WORKS AND NAVIGATION—WORKS FOR WHICH ONLY REVENUE ACCOUNTS ARE KEPT.						Expenditure on, and Receipts from, Agricultural Works for which neither Capital nor Revenue Accounts are kept.		
Surfraz-wah.	Fuleli Canal.	Total.		Under Executive Engineer, Shikárpur Canals.	Under Executive Engineer, Ghár Canals.	Under Executive Engineer, Hyderabad Canals.	Under Executive Engineer, Fuleli Canals.	Under Executive Engineer, Karachi Canals.	Total.		Expendi-ture.	Re-ceipts.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs	Rs.		Rs.	Rs.
...	54,173	54,173	1,30,976	...	...	...	...	...	...			
...	1,264	1,264	3,372	...	...	...	...	...	...			
										BEGÁRI CANALS.		
...	55,437	55,437	1,34,348	...	...	...	...	...	...	*Kashmor Bund.*		
1,18,559	10,40,806	31,86,474	1,14,12,198	...	...	...	...	...	...	Maintenance and repairs to the Bund	31,520	...
6,121	40,560	1,42,601	4,24,181	...	...	...	...	...	...	Rent of Telegraph line at Badin	1,800	...
										Constructing new loop ...	1,09,006	...
										Do. two small Bunds	1,176	...
1,24,680	10,81,366	33,29,075	1,18,36,379	...	...	...	...	...	...	Surveying a new canal in the Upper Sind Frontier.	218	...
										General charges for Establishment and Tools and Plant	40,068	...
2,326	27,205	42,066	1,55,605	6,290	8,236	16,411	788	20,218	51,943	Share of Collection charges in the Civil Department.	991	...
24,007	4,31,989	12,18,651	21,38,818	3,56,229	4,41,381	5,51,881	55,454	6,10,358	20,15,303			
26,333	4,59,194	12,60,717	22,94,423	3,62,519	4,49,617	5,68,292	56,242	6,30,576	20,67,246			
										Irrigation share of Land Revenue	...	10,131
33,963	5,97,041	9,11,317	21,14,729	...	...	...	...	...	...			
2,22,768	58,00,348	2,01,65,961	3,12,53,167	...	...	...	...	...	...	Total, Begári Canals ...	1,84,779	10,370
2,56,731	63,97,389	2,10,77,278	3,33,67,896	...	...	...	...	...	...			
										SHIKÁRPUR CANALS.		
										Kámpur Bund.		
23,075	2,68,082	5,20,880	8,20,292	1,52,137	2,61,915	2,78,581	34,667	2,92,836	10,20,136	Maintenance and repairs.	1,373	...
492	4,254	9,367	16,654	...	...	...	...	...	...	General charges for Establishment and Tools and Plant	447	...
23,567	2,72,336	5,30,247	8,36,946	1,52,137	2,61,915	2,78,581	34,667	2,92,836	10,20,136			
2,18,670	44,58,311	95,43,263	1,47,22,027	...	..	...	...	...	...	Total Shikárpur Canals ...	1,820	8
7,330	1,30,058	2,57,260	4,40,363	...	...	...	...	..	...			
										Ghár Canals	...	9
2,26,000	45,88,369	98,00,523	1,51,62,390	...	...	...	...	...	...	Eastern Nára District ...	...	4
2,766	1,86,858	7,30,470	14,57,477	...	...	...	...	...	...			
30,731	18,09,020	1,12,76,755	1,82,05,506	...	...	...	...	...	...	KARÁCHI CANALS.		
										Miscellaneous Receipts ...	...	2
										Mathematical Instrument Depôt in Sind	4,163	...
...	.....	...	...	...	..	..	...	...	...	Tools and Plant charges of the Superintending Engineer...	571	...
...	.....	...	...	...	..	...	...	...	...			
...	.....	...	...	...	...	...	...	...	...		4,734	2
...	.....	...	...	...	...	...	...	...	...	Total ...	1,91,333	10,393

on account of proceeds from sale of occupancy rights in lands in previous years.
Vide Government Resolution No. 1697, dated 2nd October 1889.

R. C. F. VOLKERS,
for Examiner, Public Works Accounts.

BUKKUR GAUGE.

Series of readings for the year 1889.

Series of Mean readings for 10 years ending 1889.

Series of Mean readings for 4 years ending 1888.

Days.	June. Readings for 1889.	June. 10 years' M. ending 1889.	June. 4 years' M. ending 1888.	July. Reading for 1889.	July. 10 years' M. ending 1889.	July. 4 years' M. ending 1888.	August. Readings for 1889.	August. 10 years' M. ending 1889.	August. 4 years' M. ending 1888.	September. Readings for 1889.	September. 10 years' M. ending 1889.	September. 4 years' M. ending 1888.	Remarks.
	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	
1 ...	8 3	8 7	9 6	14 2	11 11	11 1	13 9	14 3	14 6	13 6	12 7	13 3	Readings of the year 1889 shown in Roman. Mean readings for 10 years ending 1889 shown in Block. Mean readings for 4 years ending 1888 shown in Italics. M. is marked for "mean."
2 ...	8 1	8 8	9 8	14 4	12 0	11 2	13 10	14 4	14 7	13 9	12 6	13 2	
3 ...	7 11	8 10	10 0	14 6	12 2	11 3	13 11	14 4	14 6	13 10	12 3	12 10	
4 ...	7 8	9 0	10 0	14 9	12 4	11 6	14 1	14 3	14 4	13 7	12 1	12 5	
5 ...	7 10	9 6	10 3	15 0	12 5	11 6	14 1	14 1	14 1	13 2	11 11	11 11	
6 ...	8 0	9 9	10 4	14 11	12 7	11 10	14 5	14 2	14 1	12 7	11 11	11 7	
7 ...	8 6	9 11	10 4	15 0	12 10	12 2	14 6	14 2	14 0	11 11	12 0	11 6	
8 ...	8 8	10 1	10 3	15 1	13 0	12 4	14 6	14 3	14 1	11 4	12 0	11 6	
9 ...	8 11	10 2	10 1	15 2	13 2	12 7	14 3	14 3	14 1	10 11	11 10	11 7	
10 ...	9 3	10 2	9 10	15 4	13 3	12 9	13 10	14 3	14 3	10 6	11 7	11 7	
11 ...	9 5	10 2	9 8	15 7	13 5	13 0	13 4	14 3	14 5	9 11	11 3	11 3	
12 ...	9 7	10 3	9 8	15 9	13 7	13 4	13 1	14 3	14 6	9 5	11 0	10 11	
13 ...	9 3	10 3	9 7	15 9	13 8	13 5	13 4	14 4	14 9	9 3	10 10	10 8	
14 ..	9 6	10 5	9 5	16 0	13 8	13 4	13 6	14 5	15 0	9 3	10 7	10 4	
15 ..	10 4	10 7	9 2	15 11	13 10	13 5	13 8	14 5	15 0	9 4	10 3	9 9	
16 ..	11 1	10 9	9 1	15 11	13 11	13 6	14 3	14 5	15 0	9 6	9 11	9 2	
17 ...	11 7	11 1	9 3	16 4	14 0	13 8	14 6	14 2	14 6	9 8	9 9	8 10	
18 ...	12 1	11 4	9 7	16 3	14 2	14 0	14 7	14 0	14 1	9 8	9 9	8 6	
19 ...	12 3	11 8	10 0	16 7	14 3	14 1	14 9	13 11	13 9	9 9	9 8	8 3	
20 ...	12 7	11 8	10 0	16 5	14 3	14 3	14 11	13 10	13 9	9 9	9 8	8 0	
21 ...	12 11	11 8	10 2	15 9	14 3	14 3	14 10	13 9	13 9	9 9	9 7	7 9	
22 ...	13 1	11 9	10 3	15 6	14 3	14 3	14 9	13 9	13 11	9 7	9 4	7 8	
23 ...	13 0	11 7	10 2	15 1	14 3	14 2	14 10	13 9	14 2	9 7	8 11	7 6	
24 ...	13 0	11 7	10 2	14 11	14 4	14 1	14 8	13 7	14 4	9 4	8 5	7 3	
25 ...	13 1	11 7	10 2	14 9	14 4	14 0	14 5	13 5	14 3	9 0	8 1	7 2	
26 ...	13 2	11 7	10 5	14 9	14 3	14 0	14 1	13 3	14 0	8 8	7 11	7 1	
27 ...	13 4	11 7	10 8	14 7	14 3	14 1	13 10	13 2	14 1	8 3	7 8	7 3	
28 ...	13 7	11 7	10 9	14 5	14 3	14 3	13 6	13 1	14 0	7 11	7 5	7 1	
29 ...	13 8	11 8	11 0	13 11	14 3	14 5	13 4	13 1	14 1	7 7	7 3	7 0	
30 ...	13 11	11 9	11 0	13 8	14 3	14 5	13 2	13 1	13 11	7 2	7 0	6 9	
31 ...	...	...	...	13 7	14 3	14 6	13 3	12 9	13 6	...	...	...	

KOTRI GAUGE.

Series of readings for the year 1889.

Series of Mean readings for 10 years ending 1889.

Series of Mean readings for 4 years ending 1888.

Days.	June. Readings for 1889.	June. 10 years' M. ending 1889.	June. 4 years' M. ending 1888.	July. Readings for 1889.	July. 10 years' M. ending 1889.	July. 4 years' M. ending 1888.	August. Readings for 1889.	August. 10 years' M. ending 1889.	August. 4 years' M. ending 1888.	September. Readings for 1889.	September. 10 years' M. ending 1889.	September. 4 years' M. ending 1888.	Remarks.
	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	
1 ...	10 9	10 6	11 6	16 4	14 2	13 8	18 10	17 6	18 1	18 6	17 3	18 6	Readings of the year 1889 shown in Roman. Mean readings for 10 years ending 1889 shown in Block. Mean readings for 4 years ending 1888 shown in Italics. M. is marked for "mean."
2 ...	11 2	10 8	11 9	16 7	14 3	13 8	18 9	17 6	18 2	18 3	17 2	18 5	
3 ...	11 4	10 10	12 2	16 8	14 4	13 9	18 8	17 6	18 2	18 2	17 0	18 4	
4 ...	11 4	10 11	12 5	16 10	14 5	14 0	18 8	17 6	18 3	18 2	16 11	18 3	
5 ...	11 2	11 0	12 8	17 1	14 7	14 1	18 9	17 7	18 3	18 1	16 10	18 1	
6 ...	10 10	11 2	12 10	17 3	14 9	14 3	18 9	17 8	18 4	18 0	16 8	17 10	
7 ...	10 7	11 6	13 1	17 4	14 11	14 6	18 10	17 8	18 4	17 9	16 6	17 4	
8 ...	10 7	11 10	13 4	17 7	15 1	14 8	18 10	17 8	18 3	17 3	16 3	16 11	
9 ...	10 8	12 1	13 6	17 10	15 3	15 0	18 11	17 8	18 2	16 9	16 2	16 8	
10 ...	11 0	12 4	13 7	18 1	15 5	15 4	19 2	17 9	18 2	15 11	16 1	16 6	
11 ...	11 5	12 6	13 7	18 3	15 7	15 8	19 3	17 10	18 2	15 3	16 0	16 5	
12 ...	11 8	12 7	13 4	18 4	15 9	15 11	19 3	17 11	18 4	14 9	15 10	16 3	
13 ...	12 0	12 7	13 1	18 6	16 0	16 1	19 0	17 11	18 4	14 4	15 7	16 1	
14 ...	12 2	12 7	12 11	18 7	16 2	16 3	18 9	18 1	18 5	13 11	15 4	15 9	
15 ...	12 3	12 7	12 9	18 8	16 2	16 4	18 8	18 1	18 6	13 7	15 1	15 5	
16 ...	12 3	12 8	12 8	18 9	16 3	16 5	18 8	18 1	18 7	13 7	14 11	15 1	
17 ...	12 6	12 10	12 6	18 10	16 5	16 7	18 9	18 2	18 9	13 7	14 7	14 7	
18 ...	13 3	13 0	12 4	19 0	16 6	16 8	18 9	18 2	18 10	13 7	14 3	14 1	
19 ...	13 11	13 2	12 3	19 2	16 8	16 10	18 10	18 1	18 10	13 9	14 2	13 9	
20 ...	14 6	13 5	12 6	19 3	16 9	17 1	18 11	18 0	18 9	13 9	14 0	13 4	
21 ...	15 0	13 8	12 9	19 5	16 11	17 3	19 1	17 11	18 5	13 9	13 10	13 0	
22 ...	15 6	13 11	12 11	19 7	17 0	17 4	19 2	17 10	18 4	13 10	13 9	12 9	
23 ...	15 8	14 0	13 0	19 8	17 1	17 4	19 3	17 10	18 4	13 9	13 7	12 6	
24 ...	15 9	14 0	13 0	19 9	17 2	17 6	19 4	17 8	18 4	13 8	13 5	12 4	
25 ...	16 0	14 1	13 1	19 9	17 4	17 9	19 6	17 8	18 5	13 5	13 2	12 1	
26 ...	16 1	14 1	13 1	19 8	17 5	17 10	19 6	17 8	18 6	13 2	12 10	11 11	
27 ...	16 1	14 1	13 1	19 7	17 6	17 9	19 5	17 8	18 8	12 11	12 5	11 9	
28 ...	16 2	14 1	13 2	19 6	17 7	17 10	19 4	17 7	18 8	12 7	12 1	11 8	
29 ...	16 3	14 1	13 5	19 5	17 8	17 11	19 2	17 5	18 7	12 3	11 10	11 7	
30 ...	16 3	14 1	13 7	19 3	17 8	18 0	18 11	17 4	18 6	12 0	11 7	11 6	
31 ...	..	...	...	19 1	17 7	18 1	18 9	17 4	18 6	...	...	...	

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

List of Highest Readings on Bukkur and Kotri Gauges for 10 years from 1880 to 1889.

BUKKUR GAUGE.

1880.			1881.			1882.			1883.			1884.			1885.			1886.			1887.			1888.			1889.		
Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.	Date and Month.	Feet.	Inches.
8th July ..	14	11	20th June ..	14	5	7th August ..	17	7	17th July ..	15	11	19th August ..	15	9	20th July ..	15	5	22nd July ..	16	3	18th August ..	16	7	29th August .	14	5	19th July ..	16	7

KOTRI GAUGE.

14th August ..	17	1	28th August ..	17	2	17th August ..	20	5½	26th July ..	18	9	27th August ..	19	2	4th September.	20	4	19th August ..	20	3	22nd August ..	19	8	3rd September	17	11	24th July ..	19	9

H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

No. 4405 of 1890.

PUBLIC WORKS DEPARTMENT.

To

THE SECRETARY TO GOVERNMENT,
PUBLIC WORKS DEPARTMENT,
Bombay.

Camp Badra, 24th December 1890.

SIR,

I have the honour to forward the Irrigation Revenue Report for this Division for 1889-90 with the usual accompaniments.

2. The report is a few days later than usual, and although there are exceptional reasons to account for the delay this year, I cannot hold out any hope of its being ready earlier in future in its present form. Absolute accuracy in the figures showing the return given by the expenditure is not necessary in a report of this nature, and that this may be attained is the chief reason of delay. The scope of this report was not intended to include financial results, but to give a clear account of the work and administration of the Irrigation Department in the province; and it is desirable that it should be relieved of all matter foreign to its original purpose.

3. The last batch of returns necessary for the compilation of the numerous statements and tables were received from the Examiner, Public Works Accounts, on the 29th November, since when every moment that could be spared from the heavy routine work has been devoted to the report now submitted, while the amount of other work awaiting disposal, already large, has greatly increased. With the exception of those from Hyderabad, no returns for crops, as ordered in Government Resolution No. 51 W. I.—721 of 1890, have been received complete. I have not delayed this report for them, but they can be submitted hereafter as required.

I have the honour to be,
Sir,
Your most obedient Servant,
H. M. THOMPSON, M.Inst.C.E.,
Superintending Engineer in Sind.

FORWARDED THROUGH THE COMMISSIONER IN SIND.

No. 563 of 1891.

PUBLIC WORKS DEPARTMENT.
Commissioner's Office,
Karáchi, 17th February 1891.

Irrigation Revenue Report for 1889-90.

Submitted to Government.

2. The inundation, both in respect of height and duration, was one of the best ever known, and judged by the readings on the Bukkur gauge was as nearly perfect as possible. The rainfall, which is so frequently harmful rather than beneficial to the crops in Sind, was seasonable, though below the average. The effect of the favourable season is manifest in a very marked extension of cultivation and a further considerable increase in the canal revenue, which has been steadily advancing during the past five years.

3. The calamities to which the agricultural classes in this Province are so much exposed were not, however, altogether absent. Locusts appeared in all parts of the country early in the season, and remained during the greater part of the cold weather. The injury caused by them was not, however, so great as

might have been expected, considering the magnitude of the swarms and the wide-spread area over which their visitations extended. As usual in years of high inundations, considerable areas were submerged by floods from the river. The flood from the Bhawalpur State, which passes through the Rohri Division and ultimately falls into the bed of the Eastern Nára, again appeared after a lapse of several years. The Superintending Engineer remarks that though the gauge readings at Bukkur were higher in 1882 than in 1889, no flood came from Bhawalpur in the former year. The occurrence of a spill from the river at a particular point does not depend so much on the general height of the inundation as on the set of the river at the place, and the erosion of high ground which previously checked the overflow. In the Rohri Division, where there are few canals and the area under kharíf crops is small, the coming of these floods is always welcomed by the people, as they enable them to bring wide stretches of land under rabi crops; and until means can be devised for irrigating this tract of country by canals, the exclusion of the floods would do more harm than good. Owing to breaches which occurred in the Mitho bund on the right bank of the river above Lárkhána, a large area of the best kharíf cultivation in the Province was swamped, the town of Lárkhána was endangered, and the traffic on the railway impeded, though owing to the prompt measures taken for passing off the flood water it was not interrupted. The flood which took off on the left bank of the river at Budh-ka-takar, nearly opposite the town of Jerruck, assumed the proportions of a very considerable river, which after spreading over Guni, Mirpur and Jati Tálukas, found its way into the Runn of Kutch. The revenue was largely increased by these floods, as much of the flooded land was brought under rabi cultivation after the subsidence of the water; but some of the land-holders in the tracts affected suffered severe losses.

4. The remarks made by the Superintending Engineer in paragraphs 5 and 6 of his report, regarding the impossibility of fixing the proper bed levels of canals with reference to the Bukkur gauge, deserve attentive consideration. The figures given show conclusively that, if the readings taken at Bukkur are trustworthy, they cannot be taken as a guide in determining the bed levels of canals, and in order to decide upon the proper levels we must rely upon careful observation of the state of the river at the mouth of each canal every year. Hitherto but little has been done towards recording the changes in the course of the river, and observing its fluctuations in different seasons, though a series of such observations might lead to most useful results. The first necessity is an accurate survey of the river bed between the embankments and when the charts have once been prepared, the changes which occur each year can be recorded on them without much difficulty or expense. Gauges might also be set up with advantage at places where the course of the river varies but slightly, such as the artificial head of the Fuleli, and a comparison of the different readings might be very useful.

5. In paragraph 8 of the report the question of Abkaláni establishments is touched upon, and the Superintending Engineer again recurs to the subject in paragraph 23. It is indisputable that the establishments should be strong enough to carefully watch the embankments during the inundation season. But there is reason to believe that in former seasons the establishments were kept up in full strength longer than was necessary, and also that sufficient precautions were not taken to ensure that men borne on the rolls and drawing pay were actually present and doing their work. It would be impossible to keep up establishments sufficiently large to meet all emergencies, and in case of need reliance must be placed on the assistance of the inhabitants of the neighbouring villages which is always cheerfully and promptly given. The establishments were reduced during the season under report by the late Superintending Engineer, with the concurrence of the Commissioner, after full consideration of the requirements of each division, and no reason has been given in this report to justify the opinion that they were dangerously low.

6. Regarding the remarks made in paragraphs 9 and 22 of the report on the subject of the clearance of canals, the Acting Commissioner would observe that, although the deposit of silt in some of the older canals may be much greater than it would be if they were less faulty in construction, the removal of the silt

is absolutely necessary for the maintenance of the revenue, a very large proportion of which is derived from the old canals. There is a tendency on the part of some of the Engineers, in their desire to improve the appearance of the canals and to bring their lines into accordance with engineering principles, to forget that the primary object of the canals is to supply water to as large an area as possible, and that an ordinary ditch watering 1,000 acres is better than a trim well designed canal which can only irrigate 500. If the money required is forthcoming, improvements of the kind indicated by Mr. Thompson would no doubt be desirable, but in the meanwhile what is imperatively necessary is that the old canals should be maintained in a condition to carry as much water as possible. The Acting Commissioner entirely agrees with Mr. Pritchard that the maintenance grant should be devoted to the clearance of the canals and that expenditure under other heads, such as jungle cutting, inspection paths, requires to be carefully watched and kept within the narrowest limits.

7. The revenue returns for the year show an increase of nearly half a million acres in the area under cultivation, and of Rs. 8,66,923 in the irrigation share of the net consolidated assessment, as compared with the average of the previous five years. This result will appear the more satisfactory when it is noticed that there has been a steady improvement during the five preceding years; and that even as compared with the season of 1888-89, which was up to that time the best on record, there has been an increase of 222,248 acres in the area under cultivation and of Rs. 3,58,235 in the irrigation share of the revenue.

8. The comparison with the results obtained in 1878, also a year of high flood, when very large tracts of country were submerged, is interesting, but Mr. Thompson has omitted to take into consideration the effect of the higher rates of assessment introduced under the new settlements, and the new works carried out in the Upper Sind Frontier and the Thar and Párkar Districts, which would probably account for a considerable portion of the sum of Rs. 17,43,660 shown in favour of 1889. A very great improvement has, however, undoubtedly taken place. Cultivation is now more permanent, more careful and of a better class. But the lesson to be learnt from the comparison is that if the cultivating power of the Province is to be fully utilised, and full advantage is to be derived from the protective embankments, more water must be supplied by means of canals to compensate for the exclusion of the flood water on which large areas were cultivated in 1878.

9. The increase noted is common to all the canal divisions except the Begári, where there was a slight decrease in kharíf and a large decrease in rabi cultivation. This is due to the defective working of the Begári Canal and the Unharwah, in which the supply was short owing to unfavourable changes in the back-water from which they take off.

10. The assessment on account of hakába or water-rate on land cultivated in Khelat territory on water supplied by Sind canals and in jághirs increased from Rs. 1,37,455 to Rs. 1,42,819. The greater part of this amount, Rs. 79,983, was leviable on Khelat lands, and the Acting Commissioner would suggest that in future the revenue derived from this source should be shown separately, as a water-rate levied according to agreement on land situated in foreign territory has nothing in common with a cess charged on alienated land in Sind. It is satisfactory to note that there has been a further improvement in the collections made on account of Khelat lands, and the arrears outstanding at the close of the year were reduced from Rs. 26,729 to Rs. 12,758.

11. The net consolidated revenue for collection, after the deduction of remissions, amounted to Rs. 50,93,251, and Rs. 41,296 remained to be collected on account of previous years, so that the total for collection was Rs. 51,34,549. Of this amount, Rs. 50,62,420, or 98·6 per cent. of the total, were collected during the year and the outstanding balance amounted to Rs. 72,127. When all the circumstances of the season, the losses caused by floods, the damage done by locusts and the short supply in the Begári and Unharwah are taken into consideration, this result may be considered very satisfactory. It may be noted that the collections have for the first time reached fifty lákhs of rupees, and the irrigation share of the collections amounted to Rs. 45,56,187.

12. The total realizations on account of canal revenue under all heads are shown in paragraph 19 of the report, from which it will appear that the receipts exceeded the average of the previous five years by Rs. 8,16,307 and were Rs. 3,16,119 higher than in 1888-89.

13. The remissions granted during the year were necessarily heavy owing to the injury caused to the crops by floods, locusts, and in the Upper Sind Frontier district by want of water in the Begári and Unharwah. They reached the large total of Rs. 2,33,442, two-thirds of which were granted on account of floods in the Ghár, Fuleli and Karáchi divisions.

14. The details of expenditure given in this report do not require much comment. They relate to the financial year, while the revenue figures are for the season, and no useful comparison can be made between the two sets of figures. The remarks made by the Superintending Engineer on the subject of expenditure on jungle cutting, inspection paths and Abkaláni establishments have been dealt with in paragraphs 5 and 6 of this memorandum. The question raised regarding the head to which expenditure on bunds should be debited has already been decided by Government Resolution No. 6 A. I.—90 of 16th January 1891, which directs that such expenditure shall in future be debited to Revenue and Agricultural Works.

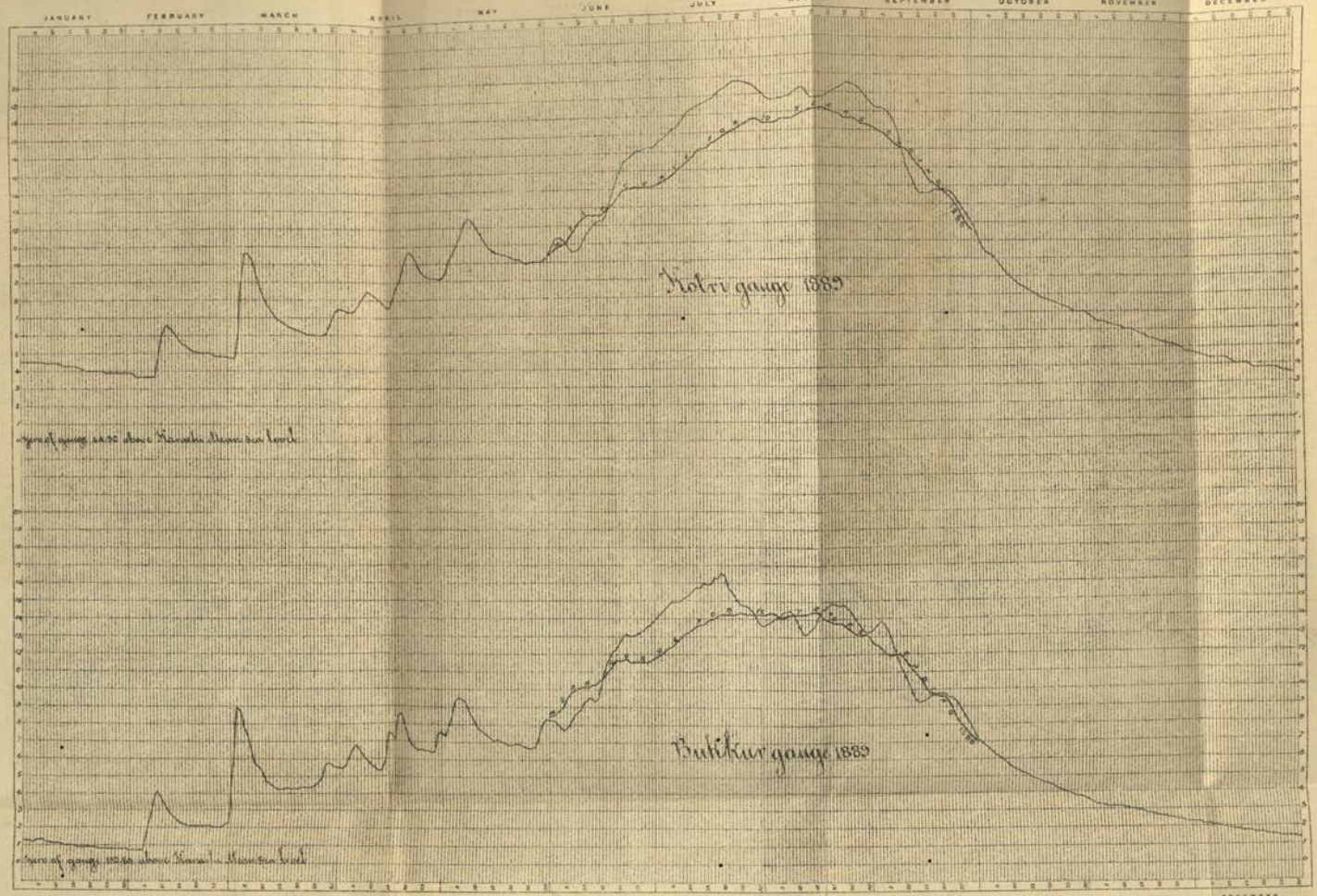
15. A comparatively large sum, Rs. 3,93,302, was spent on new works classed as Extensions and Improvements; but as pointed out by Mr. Thompson, the greater part of this expenditure, Rs. 1,56,834, was devoted to strengthening the river embankments. The excavation of the new feeder to the Western Nára, now called the Pritchard Canal, at a cost of Rs. 85,961, and the improvements to the Dambrowah and the Renwah, costing Rs. 16,914 and Rs. 32,500, respectively, account for the greater part of the remainder. Many small improvements are required in the old canals, which though of no great importance taken separately, would collectively greatly benefit the revenue without materially increasing the cost of maintenance. Hitherto very little has been done in this direction, and most of the old canals have been little, if at all, improved since the Province came into the possession of the British Government. In the opinion of the Acting Commissioner no improvement can be expected until the local officers are allowed to carry out schemes for minor improvements on their own responsibility. In last year's report it was proposed that a sum of Rs. 1,20,000 should be placed at the disposal of the Superintending Engineer each year to be expended, with the sanction of the Commissioner, on petty improvements and extensions of existing canals; but Government refused to entertain the proposal on the ground that it would be inexpedient to relax the control exercised by Government over such expenditure. The Acting Commissioner would, however, respectfully point out that the Superintending Engineer is already entrusted with the control over the distribution and expenditure of the repair and maintenance grants, and there seems no reason to anticipate that the comparatively small sum now asked for would be spent with less care and discretion. For a proper appreciation of each scheme local knowledge is absolutely essential, and a scrutiny of the plans and estimates for each small work in the Public Works Secretariat may often cause vexatious delay but can seldom lead to any useful result. The Acting Commissioner trusts that Government will find it possible to accede to the request which is now again submitted for consideration.

16. During the year under report the late Mr. G. R. Lambert was head of the Irrigation Department in Sind; and the striking success which has been achieved during the past three years is in great measure due to his zeal and ability and the willingness with which he entered into all schemes of improvement. His intimate knowledge of the country and the people, gained by a long term of service in Sind, were of the greatest service, and by his death Government have been deprived of the services of a most valuable officer.

E. W. TREVOR, Colonel,
Acting Commissioner in Sind.

B 1744—15

BOMBAY: PRINTED AT THE GOVERNMENT CENTRAL PRESS.

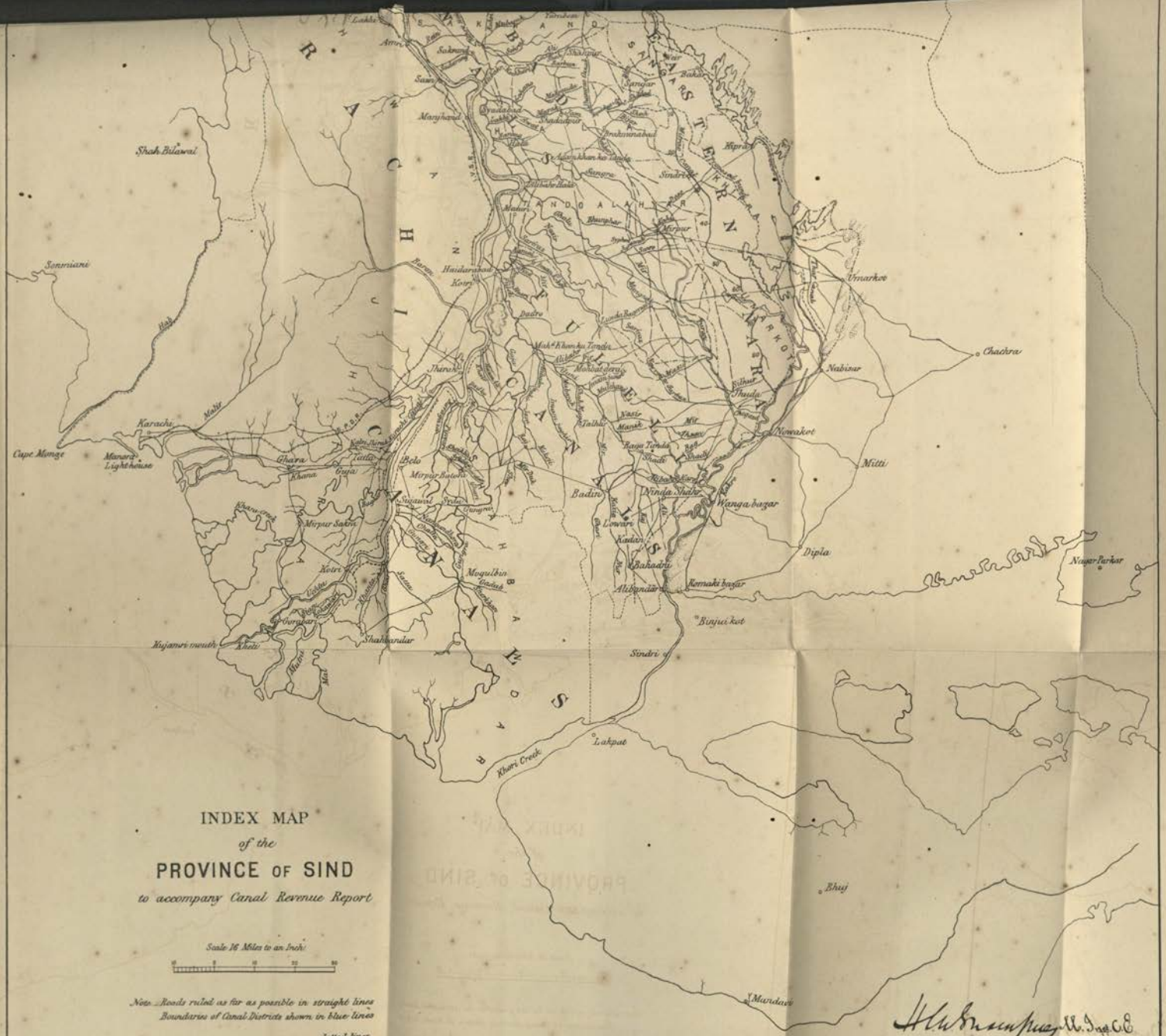


Grassed Paper to register the rise and fall of rivers be supplied by the Geographical Branch of the Public Works Department, Julia Office, London 1870

Photozincographed from a printed copy
Govt Photozinco Office Poona 1881

H. M. Lucas Maj
M. Inst. C.E.
Superintending Engineer
in Sind

Temple dera
Jhatpat
Begari
Shikarpur
Khairpur
Kot Diji
Kot Imamgarh
Nasirabad
Kakar
Johi
Dadu
Sehwan
Shah Bilawal
Jamjhani
Haidarabad
Kotri
Jhirak
Mirpur
Umarkot
Nabisar
Chachra
Sangrur
Sukkur
Rohri
Larkhana
Mehar
Manjhand
Tando Allahyar
Tando Muhammad Khan
Mahmud Khan ka Tando
Sindri
Sangra
Maker
Bhanbhor
Pithoro
Jhirak
Kotri
Hyderabad
Nasirabad
Khairpur
Shikarpur
Sukkur
Rohri
Sangrur
Mirpur
Umarkot
Nabisar
Chachra
Kot Imamgarh
Shah Bilawal
Jamjhani
Haidarabad
Kotri
Jhirak
Mahmud Khan ka Tando
Tando Muhammad Khan
Manjhand
Sehwan
Dadu
Johi
Kakar
Nasirabad
Larkhana
Ghaibi dera



INDEX MAP
of the
PROVINCE OF SIND
to accompany Canal Revenue Report

Scale 16 Miles to an Inch

Note.—Roads ruled as far as possible in straight lines
Boundaries of Canal Districts shown in blue lines
dotted lines

Karachi 18th September 1880

H. M. Bacon, Lt. Inp. C.E.
Superintending Engineer.
for Irrigation.
in Sind

Photozincographed from a Lithograph
Govt Photozincon Office Poona 1881

00133825

Digitized with financial assistance from

Government of Maharashtra

on 01 February, 2020